ENVIRONMENTAL PROTECTION AGENCY

1980 Budget Estimate

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ENVIRONMENTAL PROTECTION AGENCY

Budget Summary

The Environmental Protection Agency's 1980 budget proposal for its operating programs totals $1,284,000,000, an increase of $73,355,000. This budget also requests $3.8 billion for grants for waste water treatment plant construction. An appropriation of $3,238,000 is also requested within EPA's submission to provide for 1980 funding of the U. S. Regulatory Council.

The 1980 EPA budget emphasizes four basic thrusts: regulating public health hazards effectively, ensuring effective enforcement of the laws, helping State and local governments assume as much environmental responsibility as possible, and investing seriously in both management and regulatory reform.

Much of the environmental legislation that Congress recently enacted has broadened EPA's mission so that the Agency is now a preventive public health as well as an environmental agency. Major increases that reflect this broader mission include the following:

- Funds requested for the toxic substances programs will increase by 75 percent from $58.9 million to $103.3 million.

- Funds included in the budget request to implement the Safe Drinking Water Act will rise by $11.3 million (16 percent) of which $3.2 million is an increase for State drinking water program assistance.

- Funds requested for public health initiatives and health effects research and development increased by $34.4 million to $112.9 million, a 44 percent rise.

- Funds requested for hazardous waste management grants and technical assistance increased by $6.5 million (28 percent).

In addition, funds requested for State and local air control agency programs will increase by $5.6 million. The budget also includes a $25 million request for a new grant initiative -- integrated environmental assistance, and $40 million for Section 208 water quality planning grants. However, no new funds are being requested for Section 175 air transportation planning grants. Also, support for State water quality control agency assistance under Section 106 will be decreased by $3.6 million. However, provisions of the Clean Water Act will allow States to use portions of their waste water treatment construction grants management assistance funds for the administration of State water quality control activities.

The Agency's budget proposals are categorized under eight appropriation accounts as follows:

- Research and Development
- Abatement and Control
- Enforcement
- Agency and Regional Management
- Buildings and Facilities
- Scientific Activities Overseas
- Construction Grants
- U. S. Regulatory Council

A summary of each appropriation and its major changes follow.

Research and Development

The highlight of the research and development budget for 1980 is a major initiative in preventive health to improve the Agency's health data base. EPA's legislative authorities typically impose short deadlines for action, requiring the Agency to make decisions often on the basis of incomplete data. Such actions may lead to costly over-regulation because of the necessarily conservative approach taken to assure the protection

The public health initiative, totalling $37.0 million within the air, drinking water, toxics, and radiation media, will focus on three critical research and development activities. These areas were first identified by the Federal agencies responsible for regulating the manufacture, use, and disposal of toxic substances during the research planning meetings of the Interagency Regulatory Liaison Group. These agencies were joined by the basic science research institutes for a cross agency zero-based-budget exercise on toxics research. The high priority areas identified through these interagency reviews are: (1) the development of short-term and screening tests to permit the rapid, inexpensive detection of chemicals which may pose a serious health threat; (2) the development of exposure assessment techniques to help predict the concentration of these chemicals as they reach man through various routes of exposure and are absorbed, transformed, or accumulated in the body; and (3) the conduct of epidemiological studies to validate and improve the predictive ability of our animal tests and exposure models.

The net change for the Research and Development appropriation, reflecting this initiative as well as other increases and decreases, amounts to an increase of $34.7 million. Highlights for each media follow.

Air

The total request of $72.0 million includes an increase of $15.0 million for preventive public health research on the effects of criteria, noncriteria, and transportation related air pollutants. The Clean Air Act Amendments of 1977 require the reevaluation and revision of the health effects criteria which support ambient air quality standards at least every five years. New research will provide data on the synergistic effects of exposure to combinations of pollutants and the effects of chronic exposure on healthy and especially sensitive populations. In the noncriteria and transportation health effects areas, the development of rapid identification techniques for hazardous airborne pollutants will be stressed. An increase of $2.4 million in the characterization and measurement methods development program will support research on the problems of graphite fibers and accelerate research on measurement techniques for inhalable particulate matter.

Water Quality

The overall request for water quality is $63.7 million, a decrease of approximately $3 million. This decrease is primarily the net result of discontinuing a nonrecurring congressional add-on of $8 million in 1979 for a potable water reuse demonstration, and the increase of some $4 million to establish a major program to demonstrate water reuse and recycle options for industrial waste water discharges. An additional $1.0 million will expand the development of quality assurance protocols for toxic waterborne pollutants.

Drinking Water

The total drinking water research request of $23.7 million includes an increase of $5.7 million. Most of the additional funding will support research to identify and study the role of organics and other key contaminants in adverse health effects including some cancers, heart disease, neurologic impairments, and teratogenic defects. Epidemiological studies and adaptation of short-term bioassay techniques to evalute the effectiveness of alternative treatment techniques will be emphasized.

Solid Waste

The request of $8.1 million is essentially a continuation of the current program level in solid waste research. Research efforts are directed toward the development of technologies necessary to achieve environmentally acceptable and cost-effective solid and hazardous waste management practices. Research will continue on such activities as landfilling, hazardous waste disposal, resource recovery, and alternative land methods.

Pesticides

The pesticides research program is requesting $9.6 million in 1980. The decrease of $5.5 million represents a comparative transfer of the substitute chemical program resources totalling $2.5 million to the Abatement and Control account and the nonrecurring 1979 congressional add-on of $2.8 for integrated pest management. The continuing integrated pest management program will focus on transfer of proven technology to commercial and private applicators and to the farming community. Other reductions of $.2 million are in health and ecological effects.

Radiation

The increase of $1.0 million brings the total radiation health effects research request to approximately $2.9 million and supports preventive public health research activities. The additional resources will be used to investigate chronic exposure to low levels of nonionizing radiation in animals to determine how this pervasive pollutant interacts with biological systems and what health effects result. Epidemiological studies will be initiated to complement laboratory work and to confirm the existence of health effects at environmental exposure levels.

Toxic Substances

The substantial increase in toxic substances research, from $14.8 million to $34.0 million, reflects a major new integrated research approach to assessing total human exposure to and adverse health effects from toxic substances. Preventive public health research activities totalling roughly $15.0 million are contained in both the health and ecological effects portion of the budget; the increase of $6.0 million in health effects research focuses on the development of short-term screening tests; the development of predictive models of total body burden; the refinement of neurotoxicologic detection methods; and new work in evaluative laboratory techniques. The increase of $9.0 million in the ecology program will support research initiatives focused on predicting the movement and fate of toxic substances.

Interdisciplinary

The increase of $3.9 million in this medium is a net result of a substantial increase of $7.5 million in anticipatory or long-range research, coupled with a $2.6 million reduction in the scientific assessments program and a decrease of almost $1.0 million in technical information activities. The increase in anticipatory activities will provide a stable base for long-term research, as advocated by the National Academy of Sciences and several recent congressional studies, and insure the adequacy of the scientific base for future regulatory actions. The decrease in scientific assessments reflects the completion of a short-term requirement in 1979 for a series of water quality criteria guidelines.

Energy

The energy request is decreased from $112.0 million to $102.5 million, a net change of $9.5 million. Included in this net decrease is a small increase to characterize emissions and evaluate control technologies associated with oil shale development, coal liquefaction, and gasification. This is more than offset by decreases for research on conservation and on wastes as fuels; on conventional pollutant control technology, as certain major demonstrations are completed; and in the health and ecological program.

Abatement and Control

These programs provide for development and implementation of environmental standards and guidelines, monitoring and surveillance of pollution, pollution control planning, financial and technical assistance to State and local pollution control agencies, assistance to other Federal agencies to minimize the adverse impact of their activities on the environment, and training of personnel engaged in pollution control activities. The net increase requested is $32.6 million, for a total of $718.3 million. Program changes within the Abatement and Control appropriation include the following.

Air

Funds requested for air abatement and control programs total $151.9 million, a net decrease of $34.9 million from 1979. Although there are several major increases requested in this medium, the net decrease is primarily the result of funds not being requested for Section 175 grants for which $50 million was appropriated in 1979. These funds are not being requested due to the integration during the past year of EPA and DOT planning processes to assure that transportation planning contributes to the attainment of air quality standards. (Funds appropriated for Section 175 grants in 1979 and from the DOT's planning program will be available for these purposes in 1980). The funds requested for air abatement and control programs include an increase of $14.8 for the development of New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants. The Clean Air Act Amendments require the development of New Source Performance Standards for all major stationary sources--about 100 source categories--by 1982. State and local control agency support will be increased $5.6 million. Also included is a decrease of $3.4 million for air mobile sources standards and guidelines and a $1.4 million decrease for mobile source compliance verification. Other miscellaneous changes in this media result in a decrease of $0.5 million.

Water Quality

The request for water quality abatement and control programs totals $239.5 million, a net increase of $1.8 million. The major change is an increase of $6.8 million to reimburse the Corps of Engineers for providing an estimated 600 workyears for supervision and management in the construction phase of waste treatment facilities. This assistance will allow EPA to allocate personnel presently involved in construction supervision to the study and design phases of the construction process where the potential is greatest of improving the cost-effectiveness and minimizing the environmental impact of waste water treatment plants. The budget also includes an increase of $4.7 million for the effluent standards and guidelines program and an increase of $1.9 million for NEPA compliance related to municipal waste treatment facility construction. Decreases to the water quality abatement and control program include: $2.5 million in municipal waste treatment facility construction, $3.6 million in water quality State control agency assistance, $2.3 million in dredge and fill regulations, and $3.2 million in other areas.

Drinking Water

The 1980 request of $57.8 for drinking water abatement and control represents a net increase of $5.5 million over 1979. Included in this increase is $3.0 million to be used to support EPA implementation of the public water system and ground water protection programs in those States which have not assumed primary enforcement responsibility. Funding for State grants to support programs for public water systems and ground water protection programs will increase by $3.2 million, to $37.2 million. Grants will continue for State associations of rural water districts to give training and technical assistance to small rural water systems. Decreases in this medium include $49,500 in the criteria, standards, and guidelines programs, $120,000 in training, and $600,000 in special studies and demonstrations.

Solid Waste

The $60.0 million requested for abatement and control is a net decrease of $4.8 million from 1979. This net decrease is due to a $5.2 million reduction in solid waste financial assistance to the States as part of a 5-year phase-down of Subtitle D grant funding, a reduction of $1.1 million in resource recovery grants, and the termination of a one-time $4.0 million cost for the Love Canal hazardous waste clean-up emergency. There is a $3.6 million increase in hazardous waste management grants to the States, $1.1 million increase for regional hazardous waste management, and $1.8 million for hazardous waste regulations development.

Pesticides

The request of $40.5 million for pesticide abatement and control programs reflects a net increase of $.5 million. An increase of $1.2 million will permit EPA to continue developing the first of 1,400 generic chemical standards. Over the next decade, these standards will constitute the human health and environmental basis for reregistration and residue tolerance decisions involving 40,000 pesticides now in use. A combined increase of $.5 million for registration and tolerances will help meet an expected workload increase stemming from the new conditional registration program. A slight decrease of $69,000 in the rebuttable presumption against registration (RPAR) program reflects the approaching completion of work on the initial candidate pesticides. This decrease also reflects the first step toward the total merger of RPAR resources into the generic standards efforts by 1981. Other decreases totalling $1.2 million are proposed in the special registration and pesticide use management programs.

Radiation

Funds requested for radiation abatement and control total $14.3 million, an increase of $5.9 million. The major portion of this increase is an additional $4.4 million for the development of criteria standards and guidelines on radioactive waste disposal in a time-frame consistent with the needs of other Federal agencies. The remaining $1.5 increase will be used to carry out radiation monitoring activities necessary to determine the need for regulatory action under the Clean Air Act.

Noise

Funds requested for noise abatement and control total $11.9 million, an increase of $1.9 million. These funds will support inplementation of the Quiet Communities Act of 1978. Of this increase, $0.5 million will support an effort to investigate the psychological and physiological effects of noise on humans with a special emphasis on the nonauditory effects of noise. The remaining $1.4 million increase will support additional assistance to State and local communities in areas of monitoring, manpower, and regulation development.

Interdisciplinary

Funds requested for interdisciplinary abatement and control programs total $28.5 million, a net increase of $24.1 million. A new legislative initiative will be introduced shortly in Congress titled the Integrated Environmental Assistance Act of 1979. This legislation is designed to increase State environmental program flexibility, improve and simplify program administration, enhance program integration, and provide incentivies for good performance. Specifically, it will enable States to consolidate their environmental programs and to transfer up to 20 percent of their existing grant funds from one program to others. It will also simplify program administration by allowing a single application and a single maintenance-of-effort requirement. For this initiative, this budget requests $25 million for supplementary assistance grants, additional to other EPA grant programs, to stimulate innovative and integrated solutions to environmental problems. Offsetting this increase is a slight reduction of $1.9 million in environmental impact statement reviews.

Toxic Substances

A substantial increase of $24.6 million is included in the $65.5 million proposed for the 1980 toxic substances abatement and control program. The increase will almost double the levels of testing requirements initiated, as well as the number of chemicals subject to review. It will allow full operation of the premanufacture review program with adequate review of new chemical notices and control action on those requiring it. Control actions will be taken on chemicals identified as posing unreasonable risks. The increase will enable the Agency to provide the information systems and services, information reporting, and monitoring support required for implementing the testing and evaluation and chemical control programs.

Enforcement

The EPA enforcement program has responsibilities in the areas of air, water quality, drinking water, solid waste, pesticides, toxic substances, and noise. The program is conducted in cooperation with, and in support of, State and community enforcement programs. The 1980 enforcement budget request is $95.7 million, a decrease of $1.1 million. Program changes within the Enforcement appropriation include the following.

Air

An increase of $1.4 million, to a total of $31.9 million, is proposed for air enforcement. EPA's stationary source enforcement program consists of bolstering and stimulating State efforts to ensure compliance with State Implementation Plan requirements with special emphasis on recalcitrant major (Class A) sources, responding to situations involving substantial threats to public health and safety, and accelerating the pace of implementation of the Clean Air Act Amendments of 1977, primarily those provisions relating to mandatory civil actions against major source violators and those establishing administratively imposed noncompliance penalties. The mobile source enforcement program will be placing high priority on programs aimed at reducing the failure of vehicles to meet emission standards at the time of sale and while in use. The 1980 program will focus on continued implementation of the Selective Enforcement Auditing assembly line testing program, recall and surveillance activity in support of recall, and warranty enforcement. A new strategy will place emphasis on enforcement of the antitampering and fuel switching provisions concentrated primarily in areas of the country with significant mobile source pollution problems requiring implementation of inspection/maintenance programs to meet air quality standards.

Water Quality

An increase of $0.6 million, for a total of $28.2 million, will support implementation of the Clean Water Act Amendments of 1977. The emphasis of the water quality enforcement program will be to resolve all remaining enforcement actions initiated in 1978 and 1979 against major permittees who failed to meet the July 1, 1977 deadline, by bringing those cases to decision through settlement, administrative process, or court trail. The permit program will emphasize control of toxic discharges by implementing the Agency's pretreatment program and by issuing permits with toxic controls.

Drinking Water

The request for drinking water enforcement will increase the program $105,000 and place highest priority on enforcement response in emergency situations that substantially endanger public health and safety. Other areas of focus will be the implementation of public water system and underground injection control programs, support of enforcement proceedings in 1979, and initiation of new enforcement actions.

Solid Waste

An increase of $1.3 million, to a total of $2.2 million is proposed primarily for compliance monitoring, enforcement actions, and the administrative aspects of permit issuance in those States that do not assume responsibility for the hazardous waste management program. This would include responding to emergencies and imminent hazards, as well as, enforcing the newly issued hazardous waste regulations.

Pesticides

A decrease of $1.2 million, to a total of $12.2 million, is proposed for 1980. This reflects recent reductions in Federal enforcement and inspection activities as States

increasingly assume responsibility for pesticides control through cooperative Enforcement Agreements.

Toxic Substances

An increase of $600,000, to a total of $3.8 million, is requested for enforcing new rules promulgated under the Toxic Substances Control Act.

Other

The noise program remains approximately at the 1979 level for a total of $1 million. The request for enforcement program management reflects a decrease of $100,000 from 1979 levels, for a total of $1.2 million. The regional and general counsel office shows a decrease of $100,000, for a total of $6.3 million. A decrease of $3.8 million is proposed for program support, for a total of $8.0 million.

Agency and Regional Management

This appropriation provides for executive direction, management, and support for all EPA programs at both the headquarters and the 10 regional offices. It also includes an allocated share of agencywide common services or support costs. Major emphasis is placed on integrating financial management systems, developing an integrated environmental grants program, developing a realistic approach to effective public participation programs, expanding regional management and analytical capabilities, and strengthening the zero based budgeting steering committee process.

A net increase of $5.4 million, for a total of $95.9 million, is requested for 1980. The increase includes the prorata share of the increased costs for agencywide support services due primarily to anticipated increases in the cost of facilities rental, utilities, communications, and ADP technical support and services.

Buildings and Facilities

This appropriation provides for the design and construction of new EPA-owned facilities as well as necessary repairs and improvements to existing facilities occupied by EPA. A budget of $1.4 million, representing an increase of $362,000, will allow for the continuation of the Agency's program of upgrading its own facilities both to assure that applicable health and safety standards are met and to provide more effective pollution control.

Scientific Activities Overseas

This Special Foreign Currency Program supports cooperative research and demonstration programs in other countries, using excess currencies available. The 1979 level of $2.5 million will be increased to $4 million in 1980.

Construction Grants

Grants are made to local public agencies for construction of municipal waste water treatment facilities to assist States and localities in attaining and maintaining water quality standards. The 1980 budget request includes $3.8 billion for this purpose. This request reflects implementation of the new Clean Water Amendments, the transfer of many management functions to the States, and EPA's continued emphasis on the environmental integrity of construction projects.

U.S. Regulatory Council

EPA's 1980 budget submission includes funds for the U.S. Regulatory Council and its staff. The Council, established in October 1978 at the direction of the President, is composed of the heads of those Agencies within the Executive Branch that have regulatory responsibilities. Its purpose is to maintain an overview of regulatory activities within the Executive Branch and to assist the President in managing them in a coordinated way so as to limit potential adverse impacts on the economy. The Council will operate as an independent entity; however, its 1980 budget request of $3,238,000 is included in EPA's overall budget submission for administrative convenience.

Summary

Summary of Budget Authority,
Obligations, Outlays and End-of-Year Employment
By Appropriation
(dollars in thousands)

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980
Research and Development				
Budget Authority	$317,246	$324,128	$334,034	$368,741
Obligations	329,716	325,128	331,974	368,641
Outlays	281,914	308,500	329,800	353,800
End-of-year Employment	1,762	1,784	1,803	1,751
Full-time Equivalency	...	...	2,525	2,479
Abatement and Control				
Budget Authority	520,877	664,923	685,733	718,300
Obligations	495,562	665,627	736,513	752,050
Outlays	459,614	556,100	569,500	608,455
End-of-year Employment	4,633	5,135	4,928	5,122
Full-time Equivalency	...	...	5,897	6,083
Enforcement				
Budget Authority	73,730	95,483	96,812	95,676
Obligations	72,965	95,483	96,851	95,676
Outlays	64,842	92,600	92,700	91,000
End-of-year Employment	1,721	2,020	1,922	1,939
Full-time Equivalency	...	...	2,157	2,184
Agency and Regional Management				
Budget Authority	82,750	84,263	90,503	95,858
Obligations	81,954	84,185	90,503	95,858
Outlays	71,089	82,100	90,000	87,425
End-of-year Employment	1,936	1,941	1,981	2,059
Full-time Equivalency	...	...	2,625	2,693
Buildings and Facilities				
Budget Authority	...	2,563	1,063	1,425
Obligations	2,424	2,563	2,140	1,425
Outlays	1,274	2,000	1,800	2,000
Construction Grants				
Budget Authority	4,500,000	9,000,000	4,200,000	3,800,000
Obligations	2,859,908	5,000,000	3,400,000	3,600,000
Outlays	3,186,825	4,660,000	3,100,000	3,600,000
Scientific Activities Overseas				
Budget Authority	4,000	4,000	2,500	4,000
Obligations	2,220	4,000	5,377	4,000
Outlays	1,422	5,000	2,500	3,600
Operations, Research and Facilities				
Obligations	6,611	...	2,480	...
Outlays	5,001	8,000	8,000	5,000
End-of-year Employment	...	...	...	...
Full-time Equivalency	...	...	...	...
Revolving Fund				
Obligations	500	500	580	580
Outlays	64	...	...	...
End-of-year Employment	...	20	...	...
Full-time Equivalency	...	...	...	...

Summary of Budget Authority,
Obligations, Outlays and End-of-Year Employment
By Appropriation
(dollars in thousands)

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980
Regulatory Council				
Budget Authority	...	...	...	3,238
Obligations	...	...	...	3,238
Outlays	...	...	...	2,600
End-of-year Employment	...	...	...	10
Full-time Equivalency	...	...	...	16
Trust Funds				
Budget Authority	32	...	...	...
Obligations	26	21	30	30
Outlays	19	30	...	80
Reimbursements				
Obligations	13,044	6,960	17,390	15,510
End-of-year Employment	104	60	64	64
Full-time Equivalency	...	...	71	62
Consolidated Working Fund				
Obligations	...	...	...	...
Outlays	-83	...	47	...
Total, Environmental Protection Agency				
Budget Authority	5,498,635	10,175,360	5,410,645	5,087,238
Obligations	3,864,930	6,184,467	4,683,838	4,937,008
Outlays	4,071,981	5,714,330	4,194,347	4,753,960
End-of-year Employment	10,156	10,960	10,698	10,945
Full-time Equivalency	...	...	13,275	13,517

End-of-year Employment = Permanent Positions

Summary of Budget Authority
Obligations, Outlays and End-of-Year Employment
By Media
(dollars in thousands)

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980
Air				
Budget authority.....	$172,059	$237,644	$270,617	$255,810
Obligations.....	171,190	240,076	259,751	280,809
Outlays.....	154,668	218,020	208,500	232,100
End-of-year employment....	1,791	1,954	1,932	2,023
Full-time equivalency.....	...	...	2,327	2,347
Water Quality				
Budget authority.....	312,707	309,692	332,011	331,451
Obligations.....	309,034	309,851	370,852	335,961
Outlays.....	280,964	340,373	307,452	284,800
End-of-year employment....	3,341	3,204	3,127	3,055
Full-time equivalency.....	...	...	3,856	3,790
Drinking Water				
Budget authority.....	54,925	70,125	71,051	82,319
Obligations.....	55,611	67,435	74,319	82,051
Outlays.....	42,046	40,900	58,950	66,450
End-of-year employment....	393	548	531	529
Full-time equivalency.....	...	...	595	600
Solid Waste				
Budget authority.....	35,838	71,901	73,793	70,289
Obligations.....	35,766	71,625	74,288	70,792
Outlays.....	23,160	39,580	42,340	57,600
End-of-year employment....	229	295	294	327
Full-time equivalency.....	...	...	370	412
Pesticides				
Budget authority.....	48,610	60,717	68,469	62,250
Obligations.....	52,901	60,593	70,945	64,469
Outlays.....	41,347	53,080	57,900	58,600
End-of-year employment....	990	1,013	1,003	984
Full-time equivalency.....	...	...	1,178	1,116
Radiation				
Budget authority.....	8,882	11,338	10,330	17,201
Obligations.....	8,546	11,294	10,976	16,330
Outlays.....	6,497	5,900	11,100	13,000
End-of-year employment....	209	217	205	208
Full-time equivalency.....	...	...	249	253
Noise				
Budget authority.....	11,137	10,642	11,013	12,953
Obligations.....	12,810	10,668	11,310	12,913
Outlays.....	9,400	7,880	10,530	10,320
End-of-year employment....	94	95	97	97
Full-time equivalency.....	...	...	163	178

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980
Interdisciplinary				
Budget authority.....	41,267	47,425	25,006	53,102
Obligations.....	18,257	47,259	27,559	53,006
Outlays.....	31,503	27,080	41,900	44,200
End-of-year employment....	224	392	261	244
Full-time equivalency.....	...	...	352	383
Toxic Substances				
Budget authority.....	22,824	56,732	58,951	103,316
Obligations.....	21,693	57,439	60,388	105,951
Outlays.....	12,090	27,200	34,300	70,400
End-of-year employment....	272	573	556	723
Full-time equivalency.....	...	...	579	767
Energy				
Budget authority.....	130,617	114,765	112,037	102,461
Obligations.....	133,063	116,388	112,246	102,537
Outlays.....	118,245	125,500	127,148	125,000
End-of-year employment....	160	146	149	140
Full-time equivalency.....	...	...	268	265
Management and Support				
Budget authority.....	155,737	177,816	173,804	187,423
Obligations.....	161,326	177,795	183,207	187,406
Outlays.....	157,539	161,147	181,880	178,210
End-of-year employment....	2,349	2,443	2,479	2,541
Full-time equivalency.....	...	...	3,267	3,328
Facilities				
Budget authority.....	...	2,563	1,063	1,425
Obligations.....	2,424	2,563	2,140	1,425
Outlays.....	1,274	2,640	1,800	2,000
Operations, Research and Facilities				
Obligations.....	6,611	...	2,480	...
Outlays.....	5,001	...	8,000	5,000
End-of-year employment....	...	...	...	...
Full-time equivalency.....	...	...	...	...
Construction Grants				
Budget authority.....	4,500,000	9,000,000	4,200,000	3,800,000
Obligations.....	2,859,908	5,000,000	3,400,000	3,600,000
Outlays.....	3,186,825	4,660,000	3,100,000	3,600,000
Scientific Activities Overseas				
Budget authority.....	4,000	4,000	2,500	4,000
Obligations.....	2,220	4,000	5,377	4,000
Outlays.....	1,422	5,000	2,500	3,600
Revolving Fund				
Obligations.....	500	500	580	580
Outlays.....	64	...	...	...

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980
Trust Funds				
Budget authority	32	...	...	...
Obligations	26	21	30	30
Outlays	19	30	...	80
Reimbursements				
Obligations	13,044	6,960	17,390	15,510
End-of-year employment	104	60	64	64
Full-time equivalency	...	...	71	62
Regulatory Council				
Budget authority	...	...	...	3,238
Obligations	...	...	...	3,238
Outlays	...	...	...	2,600
End-of-year employment	...	...	...	10
Full-time equivalency	...	...	...	16
Consolidated Working Fund				
Obligations	...	...	...	...
Outlays	-83	...	47	...
Total, Environmental Protection Agency				
Budget authority	5,498,635	10,175,360	5,410,645	5,087,238
Obligations	3,864,930	6,184,467	4,683,838	4,937,008
Outlays	4,071,981	5,714,330	4,194,347	4,753,960
End-of-year employment	10,156	10,940	10,698	10,945
Full-time equivalency	...	...	13,275	13,517

Summary of Increase or Decrease
Budget Authority and End-of-Year Employment
(dollars in thousands)

	Current Estimate 1979	Estimate 1980	Increase + Decrease -
Research and Development			
Budget authority	334,034	368,741	+34,707
End-of-year employment	1,803	1,751	-52
Full-time equivalency	2,525	2,479	-46
Abatement and Control			
Budget authority	685,733	718,300	+32,567
End-of-year employment	4,928	5,122	+194
Full-time equivalency	5,897	6,083	+186
Enforcement			
Budget authority	96,812	95,676	-1,136
End-of-year employment	1,922	1,939	+17
Full-time equivalency	2,157	2,184	+27
Agency and Regional Management			
Budget authority	90,503	95,858	+5,355
End-of-year employment	1,981	2,059	+78
Full-time equivalency	2,625	2,693	+68
Buildings and Facilities			
Budget authority	1,063	1,425	+362
Scientific Activities Overseas			
Budget authority	2,500	4,000	+1,500
Reimbursements			
End-of-year employment	64	64	...
Full-time equivalency	71	62	-9
U. S. Regulatory Council			
Budget authority	...	3,238	+3,238
End-of-year employment	...	10	+10
Full-time equivalency	...	16	+16
Subtotal			
Budget authority	1,210,645	1,287,238	+76,593
End-of-year employment	10,698	10,945	+247
Full-time equivalency	13,275	13,517	+242
Construction Grants			
Budget authority	4,200,000	3,800,000	-400,000
Total, Environmental Protection Agency			
Budget authority	5,410,645	5,087,238	-323,407
End-of-year employment	10,698	10,945	+247
Full-time equivalency	13,275	13,517	+242

End-of-year employment = permanent positions.

Liquidation of Contract Authority
(in thousands of dollars)

	1978	1979	1980
Construction Grants.....	$5,600,000	$4,200,000	$2,700,000

Air

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Research and Development:					
Appropriation.....	$44,293	$53,785	$53,207	$71,963	+$18,756
Permanent Positions.....	429	437	431	440	+9
Full-time equivalency....	...	...	557	536	-21
Abatement and Control:					
Appropriation.....	106,087	156,506	186,905	151,966	-34,939
Permanent Positions.....	881	892	892	943	+51
Full-time Equivalency....	...	...	1,119	1,136	+17
Enforcement:					
Appropriation.....	20,810	29,855	30,505	31,881	+1,376
Permanent Positions.....	481	660	609	640	+31
Full-time Equivalency....	...	...	651	675	+24
Total Air Program:					
Appropriation.....	171,190	240,146	270,617	255,810	-14,807
Permanent Positions.....	1,791	1,989	1,932	2,023	+91
Full-time Equivalency....	...	...	2,327	2,347	+20
Outlays.....	40,286	199,020	53,200	60,300	+7,100
Authorization Levels.....	500,500	286,500	351,197	236,500	

OVERVIEW AND STRATEGY

The Clean Air Act authorizes a national program of air pollution research, regulation, and enforcement activities. Under the Act, primary responsibility for the prevention and control of air pollution at its source rests with State and local governments, with a strong mandate that the Environmental Protection Agency (EPA) take action where States do not fulfill their responsibilities. EPA's role is to conduct research and development programs, ensure that adequate standards and regulations are established to meet environmental goals set by the Act, support State and local control activities, and ensure that the standards and regulations are effectively enforced.

These environmental goals are generally those prescribed by National Ambient Air Quality Standards (NAAQS). These standards set forth limits on the allowable concentration of a given air pollutant requisite to protect human health and public welfare. The health and other effects of pollutants are delineated in criteria documents which are the basis for the standards. National Ambient Air Quality Standards have been set for total suspended particulates, sulfur dioxide, nitrogen dioxide, carbon monoxide, photochemical oxidants, hydrocarbons, and lead. Two types of standards are set: primary standards to protect human health and secondary standards to protect the public welfare (prevention of damage to property, animals, vegetation, crops, visibility, etc.). Controlling emissions to meet these standards is handled through two major types of activities: (1) State Implementation Plans (SIP) which control pollution within each State primarily by prescribing specific emission limitations or control actions for types of polluters, and (2) national emission standards prescribed for new motor vehicles and selected stationary sources.

In addition, nationally applicable emission levels are prescribed for other pollutants deemed especially hazardous, and apply to both new and existing pollutant sources. Emissions of asbestos, beryllium, mercury, and vinyl chloride are currently being controlled as hazardous air pollutants. Benzene

has been listed as hazardous and emissions control regulations are under development.

The air program strategy has been directed primarily at the attainment of the primary NAAQS. Although the combined Federal-State-local effort at controlling air pollution has achieved a notable degree of success in improving ambient air quality across the Nation, the standards have not been attained in many areas. The Clean Air Act, as amended in 1977, recognizes this problem and sets forth a comprehensive program for achieving the standards for such areas. In general, the Act requires that the standards be attained by the end of calendar year 1982. However, in recognition of the unusual problems some areas will have in attaining the standards for photochemical oxidants and carbon monoxide, attainment of these standards should be as expeditious as possible, but in no case later than 1987.

In 1979, efforts concentrated on revising State Implementation Plans (SIP) for nonattainment areas by laying the requirements for attaining standards by the end of 1982. These revisions are due in January 1979. The Act sets forth stringent criteria that have to be met by the revised SIPs if they are to be approved by EPA. The Act also established sanctions for areas in which SIPs are not developed and implemented as required, and requires that EPA develop and implement SIP for those areas. Under the terms of the Act, construction or modification of major stationary sources would be prohibited after July 1, 1979, and certain Federal funding withheld, if the SIP for a nonattainment area is not revised appropriately.

It is anticipated that although many nonattainment areas will be able to meet standards by the end of 1982, many major urban areas will not be able to meet the photochemical oxidant and carbon monoxide standards by that deadline. Such areas will be required to submit additional plans in 1982.

Program emphasis in 1980 will stress the development and implementation of regulations in areas which will not attain the standards by 1982.

Actions will include:

- Adopting regulations for additional sources of volatile organic chemicals pursuant to EPA's control technology guidance.

- Adding inspection and maintenance (I/M) requirements following appropriate State legislative actions.

- Analyzing transportation control measures, their impact on air quality, and the encouragement of public participation in translating these analyses into appropriate regulations and schedules.

- Completing assessments of particulate sources and adopting necessary regulations.

- Developing SIP revisions to attain the new lead NAAQS.

- Developing SIP revisions for additional areas expected to be classified as nonattainment areas during 1979 and where revisions submitted in 1979 were not adequate.

In addition to the provisions related to attainment of ambient air quality standards, the Amendments established a statutory basis for prevention of significant deterioration of air quality (PSD) and a national goal for visibility protection; these provisions also require EPA studies and regulatory action. Additional PSD related actions (for hydrocarbons, nitrogen oxides, lead, and carbon monoxide) will be taken in 1980. The States will adopt SIP revisions related to PSD for sulfur oxides and particulates and submit them for EPA review and approval/disapproval during 1980.

A major Federal role in meeting ambient air quality standards is expected to continue. Failures by the States in some cases to develop the requisite regulatory framework for air pollution control will continue to necessitate Federal action to fill the gaps in otherwise adequate State control programs. Likewise, the extension of air pollution control to a large number of sources not presently covered, or covered inadequately, will intensify the need for enforcement action. EPA will supplement State/local resources to facilitate State assumption of enforcement responsibilities but, where necessary, it will continue to undertake Federal enforcement action under State Implementation Plan regulations.

The 1977 Amendments require New Source Performance Standards (NSPS) be set on a specified schedule, emission standards be set for new motor vehicles and engines, and assessments related to standard setting be carried out. Furthermore, the NAAQS are to be reviewed every five years, and procedures established for assuring utilization of local sources of coal and assessing the economic impacts of regulatory actions. These measures will result in the promulgation of a large number of NSPS between 1980 and 1982; moreover, many SIP may need to be revised when the review of NAAQS indicates that changes are due and when additional pollutants are controlled (e.g., lead).

For mobile sources, increased emphasis is being given, pursuant to Clean Air Act mandates, to tightening emission control requirements for heavy duty vehicles and to presently unregulated pollutants such as particulate matter. The program incorporates a shift in emphasis to assure that in-use vehicles meet standards. Standards and studies required by the Clean Air Act Amendments receive the highest priority.

We have given ambient air quality monitoring a priority consistent with regulations developed pursuant to the Agency's air monitoring strategy. The strategy places high priority on improving the quality of the data that are obtained by State and local monitoring networks. In keeping with this priority, we will place emphasis at both the regional and headquarters levels on restructuring the monitoring networks and validating data for selected monitoring stations identified as representing ambient trends. The restructuring of the network will allow for a substantial decrease in the reporting of ambient data by the States.

The stationary source air enforcement program is designed to utilize effectively the enforcement authorities of the Clean Air Act, as amended in 1977, to ensure nationwide compliance with State Implementation Plans (SIP). New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP). EPA's stationary source enforcement program consists of bolstering and stimulating State efforts for ensuring compliance with SIP requirements with special emphasis on major (Class A) sources and situations involving substantial threats to public health and safety, thus contributing to the resolution of attainment problems. Clean Air Act requirements pertaining to SIP, NSPS, and NESHAP

enforcement are being met. With regard to sources issued prohibition orders by the Department of Energy under the Energy Policy and Conservation Act, action is being taken where indicated.

The mobile source enforcement program will be placing high priority on programs aimed at reducing the failure of vehicles to meet emission standards at the time of sale and while in use. The 1980 program will focus on continued implementation of the Selective Enforcement Auditing assembly line testing program, recall and surveillance activity in support of recall, and warranty enforcement. A new strategy will place emphasis on enforcement of the anti-tampering and fuel switching provisions concentrated primarily in areas of the country with significant mobile source pollution problems requiring implementation of I/M programs to meet air quality standards. The nationally coordinated antitampering and anti-fuel-switching efforts will be directed toward vehicle fleets, new car dealerships, auto repair facilities, and service stations in potential I/M areas.

The research program will continue to explore the relationship of airborne pollutants to adverse health and environmental effects, identify the sources of these pollutants and the manner in which they are transformed and transported through the environment, and development and evaluate efficient, cost effective pollutant control devices. Efforts will be devoted to improving our ability to measure air pollution in a more precise and uniform manner.

Studies on the adverse health effects of air pollution will provide an improved data base to support the periodic review and revision of National Ambient Air Quality Standards required by the Clean Air Act Amendments of 1977. Research on the effects of pollutants from automotive and other sources not currently regulated will allow the Agency to determine which of these substances pose a sufficient threat to the public health to warrant regulation.

As part of EPA's preventive public health initiative, research will be expanded substantially in 1980 to strengthen the data base on which regulatory decisions are made. Attention will focus on epidemiology, rapid screening techniques, and chronic toxicological studies, which most nearly approximate the pattern of human exposure to air pollution.

Research to characterize pollutant emissions from various sources and industrial control systems will continue to support the formulation of New Source Performance Standards and will provide data to evaluate State Implementation Plans. The Agency will continue the development and deployment of inhalable particle samplers begun in 1979, leading to a fully deployed operating network in 1981. In addition, we will perform analysis of visibility measurements in national parks in support of the visibility protection goal of the Clean Air Act Amendments of 1977.

In summary, the EPA program is aimed at providing uniform guidance and supporting States and localities in their air pollution control efforts; providing an adequate level of Federal activity in those areas for which the Federal Government has the primary responsibility--the setting of emissions standards for new sources--or where Federal activity would result in a high environmental payoff--enforcement actions against major air pollution sources in cases where States do not have the resources to take action; and developing and disseminating air pollution control related knowledge and techniques supportive of the national air pollution control effort. This includes research on control technology and health effects of air pollutants.

SUMMARY OF INCREASES AND DECREASES (in thousands of dollars)

1979 Air Program.....	$270,617
Research and Development.....	+18,756
This increase includes several actions; an increase of $16 million for health and ecological effects and $3.2 million for monitoring and technical support, offset by a decrease of $.4 million for industrial processes.	
Abatement and Control.....	-34,939
The net decrease results primarily from nonrecurring Section 175 grant program (-$50 million); mobile source standards and guidelines (-$3.4 million); mobile source preproduction compliance verification (-$1.4 million). Offsetting increases will provide for air quality and stationary source planning and standards (+$15.3 million); control agency grants (+$5.6 million); and other miscellaneous changes which net to -$1 million.	
Enforcement.....	+1,376
The increase provides additional mobile source enforcement ($.7 million) and stationary source enforcement ($.7 million) activities.	

SUMMARY OF BUDGET ESTIMATE

1. Summary of Budget Request

An appropriation of $255,810,000 is requested for 1980. This request, by appropriation account, is as follows:

Research and Development.....	$71,963,000
Abatement and Control.....	151,966,000
Enforcement.....	31,881,000

This represents a decrease of $14,807,000 from the 1979 level. Included in the net decrease is an increase of $15 million to provide for setting emission standards for all significant stationary source categories before the 1982 deadline established by the Clean Air Act Amendments of 1977; a decrease of $3.5 million in the mobile source standards and guidelines program due to the anticipated completion of many tasks mandated by the Clean Air Act Amendments; an increase of $5.6 million for control agency grants to provide increased State and local agency activities in the area of State Implementation Plans (SIP); the nonrecurring transportation planning grants program, $50 million; the discontinuing of the academic training program, $.5 million; and a reduction of $1.4 million made possible by full implementation of an abbreviated certification program.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.....	$240,146
Congressional increases/decreases:	
Contractual services and monitoring and technical support.....	-3,329
Control agency grants.....	+5,000
Academic training.....	+540
Section 175 grants.....	+25,000
Mobile certification.....	+300
Reduction in lapse rate.....	-470
Office of Research and Development reprogramming.....	+1,223
Effect of October 1978 pay raise partial absorption.....	-484
Proposed October 1978 pay raise supplemental.....	+1,457
Distribution of October 1977 pay raise....	+3,054
Headquarters and regional offices reprogramming.....	-1,820
Current 1979 estimate.....	270,617

Congressional add-ons to the budget request resulted in a $25 million increase for Section 175 planning grants; $5 million for control agency support grants; $300,000 for mobile certification and review; and $540,000 for academic training. Congressional reduction of $6 million to the Research and Development contracts and monitoring and technical support resulted in a decrease of $3,329,000 to the air media. The Congress also reduced the Abatement and Control and Enforcement appropriations by $3 million to reflect a reduction in the lapse rate on filling positions which resulted in a decrease of $470,000 to the air media.

Pay raise costs, including absorption of a portion of the costs, result in a net increase of $4,027,000. The Agency request included all funds for the October 1977 pay raise in the management and support media, to be distributed by media at a later date. The increase reflected represents the share of this later distribution.

Finally, agencywide reprogrammings result in a net decrease of -$597,000, of which -$3 million is a "payback" to the water quality areawide waste treatment management activity as approved by the Appropriation Subcommittee and +$1,223,000 is reprogrammed within the Office of Research and Development from the water quality media. Other transfers are -$325,000 to the radiation media; +$1,420,000 from management and support activities; +$121,000 from the drinking water media; and -$36,000 to the noise media.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations	$171,190	$259,751
Effect of congressional changes	+21,870	...
Effect of pay raises	+970	...
Effect of reprogrammings	-500	...
Program increases	+60,000	-4,808
Change in amount of carryover funds available	+11,132	+10,366
Change in rate of obligation	-4,911	+15,000
Total estimated obligations	259,751	280,809
(From new obligation authority)	(240,439)	(250,631)
(From prior year funds)	(19,312)	(30,178)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The congressional changes discussed in the previous section are expected to result in an increase of $21,870,000 to obligations. The effect of the October 1978 pay raise as netted by absorption will increase obligations by $970,000. The reprogrammings made by the Office of Research and Development and other headquarters and regional offices are expected to decrease obligations by $500,000.

The increase in budget authority over the 1978 level is expected to result in an increase of $60 million to 1979 obligations; the program changes requested in 1980 are expected to reduce obligations by $4,808,000.

The amount of carryover funds to be obligated in 1979 is $19,312,000, an increase of $11,132,000 over the 1978 level; in 1980, it is estimated that $30,178,000 of carryover funds will be obligated, an increase of $10,866,000 from the 1979 level.

A change in the rate of obligation is expected in 1979, which would create a decrease of $4,911,000 over the 1978 level. A change in the rate of obligation is expected in 1980, which would create an increase of $10,866,000.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
PROGRAM LEVELS					
Number of pollutants covered by hazardous pollutants standards.....	4	5	5	10	+5
Number of engine families certified for conformity with emission standards..	589	558	650	700	+50
Number of source categories covered by NSPS...	28	44	31	40	+9
Number of emission tests carried out for motor vehicle certification purposes.....	1,878	1,700	1,000	1,000	...
Number of fuel economy tests carried out.....	1,251	1,160	800	800	...
Identified Class A source in U.S.....	24,040	27,000	25,000	29,000	+4,000
Assembly line testing test orders.....	33	55	35	42	+7
Certification and production inspection/ compliance.....	25	25	15	15	...
Combined fuels/vapor recovery inspections.....	23,000	15,000	20,000	25,000	+5,000
Recall investigations.....	27	28	35	40	+5
Noncompliance penalties assessed by EPA.....	...	729	700	730	+30
Number of civil/criminal actions referred by EPA..	134	317	300	350	+50

NSPS: New Source Performance Standards.
ESECA: Energy Supply and Environmental Coordination Act of 1974.

Research and Development

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -	Page
			(dollars in thousands)			
Appropriation						
Health and Ecological Effects	$28,019	$28,687	$30,594	$46,624	+$16,030	A-12
Industrial Processes . .	5,691	5,000	4,531	4,050	- 481	A-22
Monitoring and Technical Support	10,583	20,098	18,082	21,289	+ 3,207	A-27
Total	44,293	53,785	53,207	71,963	+ 18,756	
Permanent Positions						
Health and Ecological Effects	254	254	246	262	+16	
Industrial Processes . . .	22	21	20	18	- 2	
Monitoring and Technical Support	153	162	165	160	- 5	
Total	429	437	431	440	+ 9	
Full-time Equivalency						
Health and Ecological Effects	...	...	337	319	-18	
Industrial Processes . . .	...	...	36	31	- 5	
Monitoring and Technical Support	...	...	184	186	+ 2	
Total	...	...	557	536	-21	

Purpose

The air research and development program is designed to furnish EPA with the knowledge to establish prudent environmental controls based upon known or potentially adverse health and ecological effects; to define, develop, and demonstrate systems for controlling stationary source pollution; and to evaluate strategies for minimizing the emission of pollutants.

To achieve these ends, the program is structured to identify and, to the extent possible, quantify the adverse human health effects of exposure to air pollutants; to quantify the effects and fate of air pollutants on biological components and processes within the environment; to develop predictive models for pollutant emission, transport, transformation, and removal, and verify these models by actual measurements; and to develop new and improved technology for preventing and controlling air pollution and demonstrate the cost effectiveness of such technologies. The air research and development program also provides analytical measurement methods for monitoring air pollutants; provides procedures and materials to document the validity of monitoring data; and provides technical expertise, specialized facilities and equipment to the regulatory and enforcement programs.

Research and Development

Health and Ecological Effects

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Health Effects/Transportation Sources	$ 5,065	$ 4,825	$ 5,811	$ 7,243	+$ 1,432
Health Effects/Criteria Pollutants	3,718	2,000	1,837	6,800	+ 4,963
Health Effects/Non-Criteria Pollutants	6,621	8,117	10,458	17,305	+ 6,847
Ecological Effects	1,784	2,648	1,539	2,266	+727
Transport and Fate of Pollutants	10,831	11,097	10,949	13,010	+ 2,061
Total	28,019	28,687	30,594	46,624	+ 16,030
Permanent Positions					
Health Effects/Transportation Sources	47	49	55	46	- 9
Health Effects/Criteria Pollutants	62	27	24	31	+ 7
Health Effects/Non-Criteria Pollutants	87	129	118	136	+18
Ecological Effects	24	5	5	5	-
Transport and Fate of Pollutants	34	44	44	44	-
Total	254	254	246	262	+16
Full-time Equivalency					
Health Effects/Transportation Sources	...	...	84	52	-32
Health Effects/Criteria Pollutants	...	...	30	40	+10
Health Effects/Non-Criteria Pollutants	...	...	151	158	+ 7
Ecological Effects	...	...	23	11	-12
Transport and Fate of Pollutants	...	...	49	58	+ 9
Total	...	...	337	319	-18

Budget Request

The 1980 budget request for air health and ecological effects is $46,624,000 and 262 positions. This represents a net increase of $16,029,800 and 16 positions. In the health effects area, $13,242,000 and 16 positions will be applied to the air portion of the comprehensive public health initiative. New research activities will address the current inadequacies of the health data base on which costly regulatory decisions are made. Health initiatives will focus on the development and application of animal tests which can clarify the chronic effects of combinations of criteria pollutants on healthy and impaired humans; short-term and screening tests which can rapidly and inexpensively identify unregulated hazardous pollutants from stationary and mobile sources; and the refinement of epidemiological methodologies which confirm laboratory findings.

In the ecological effects area, an increase of $727,100 will be devoted to enlarging the extramural program with emphasis on effects assessment of gaseous airborne pollutants, development of a national crop loss network and expanded efforts on non-criteria pollutant impact. In transport and fate, $2,060,700 will be used to develop more accurate and precise air quality simulation models which can be used for predicting ambient pollutant concentrations resulting from sources located in complex terrain.

Program Description

Research on the adverse health effects of exposure to air pollutants provides a major portion of the scientific basis upon which ambient air quality standards are established, maintained, or revised as required by the Clean Air Act as Amended, 1977. If these standards are not set for hazardous air pollutants or if they are too lax, the health of the public may be adversely affected; if they are too stringent, the economy may be adversely affected by unnecessary costs for pollution control equipment.

The air health effects research program is divided into three program components: Health Effects--Criteria Pollutants; Health Effects-Non-Criteria Pollutants; and Health Effects--Transportation Sources. The program incorporates epidemiologic studies of targeted populations, controlled human exposure (clinical) studies, and animal toxicological studies, focusing on those air pollutants which adversely affect public health or which are suspected to do so. Investigations include (1) studies of effects from short-term and long-term exposures to combinations of criteria pollutants (in order to better define the health data base for these pollutants, and, therefore, to better determine the adequacy of existing pollutant standards); (2) studies of effects from exposure to sulfates, nitrates, metal oxides, and other inhalable particulate pollutants (in order to determine which compounds present the greatest hazards and should therefore be regulated); and (3) studies of effects from exposure to diesel exhaust products and their elements in order to determine which of these products pose a potential threat to public health.

The public health initiative will strengthen the health effects data base by attempting to improve capabilities for exposure measurement and effects measurement used in: population studies on indoor air pollutants, rural and urban dusts, and pollutants near industrial sources; human exposure studies and animal toxicologic studies on genetic, biochemical, and immune responses; and studies to better characterize susceptible human populations and relate these populations with impaired animal systems.

Research on the ecological effects of air pollutants provides the fundamental scientific basis upon which to establish and continually evaluate secondary ambient air quality standards. This research program focuses upon the effects of air pollutants on the structure and functions of ecosystems by determining the acute and chronic effects of air pollutants, singly and combined, upon individual flora, fauna and soil ecosystem components. Pollutants under study include sulfur dioxide, ozone, nitrogen oxides, hydrocarbons, halogen gases and heavy metals.

The program also attempts to characterize air pollution problems in the environment, to determine the dynamic processes and effects of these pollutants and to provide methods and techniques to measure or monitor these effects. Laboratory, greenhouse and field verifications studies will elucidate both the biological perturbations and the fate of these pollutants. Evaluations will include biogenic emissions of selected pollutants which significantly add to background emissions and, where appropriate, economic aspects will be considered.

HEALTH EFFECTS--TRANSPORTATION SOURCES

1978 Accomplishments

In 1978, the program utilized $5,065,500 and 47 positions. This includes $364,500 for grants, $1,776,100 for contracts and $90,000 on interagency agreements. Major accomplishments are listed below.

- A study on sulfuric acid emissions from oxidation catalyst equipped vehicles was completed, and it was determined that the emission levels are too low to cause significant public health effects.

- Various in vitro screening tests were completed on components of the particulate fraction of diesel exhaust and the particulate was found to contain mutagens and chemicals that cause neoplastic transformations in mammalian cell systems.

- Range-finding inhalation studies exposing cats, rats, mice and guinea pigs to evaluate levels of the total diesel exhaust from a light duty engine were completed. All appropriate biological effects endpoints were measured to determine whether any acute effects resulted. No significant acute effects were observed.

- A major expansion of the research program in Diesel Health Effects was implemented on the basis of these and other studies.

- Three short-term experiments were completed which found that mortality from infection was greater in mice exposed to diesel exhaust than in air-exposed controls.

- Exposure tests on the neurobehavioral effects of diesel exhaust on neonatal rats were completed. The results show a significantly suppressed body weight and a depressed locomotor activity after exposure when compared to control animals.

1979 Program

The 1979 resources for the air health effects transportation research program are $5,810,400 and 55 positions. Approximately $1,453,000 will be spent on contracts, $635,000 on grants, and $705,000 on interagency agreements. A description of the program is presented below.

The FY 79 program emphasizes the conduct of a wide variety of health effects studies to determine whether diesel exhaust is carcinogenic. In vitro screening studies are being performed to evaluate the relative biological effects of diesel exhaust particulate as compared to similar materials for which there is human epidemiological data (coke oven emissions, cigarette smoke condensate and roofing tar). In vivo non-inhalation studies will compare diesel particulates and these similar materials to determine which materials produce tumors. Whole animal inhalation studies will expose normal and specially developed sensitive strains of rodents to diesel exhaust to determine whether tumors develop. Non-carcinogenicity studies with whole animals will focus on the identification of chronic obstructive lung disease and neurobehavioral effects. Epidemiological research will focus on reviewing significant studies found in the literature and identifying field studies which should be performed on targeted populations exposed to diesel exhaust products.

1979 Explanation of Changes from Budget Estimate

A net increase of +$985,400 results from two actions. A net increase of +$183,200 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan +$802,000 was reprogrammed to this activity from ecological processes and effects ($126,900), transport and fate ($303,900), and health effects/criteria pollutants ($247,900) within this medium, and from transport and fate ($123,500) within the water quality medium.

1980 Plan

In 1980, $7,243,000 and 46 positions are requested for Health Effects--Transportation Sources. This includes approximately $2,500,800 for contracts, $1,106,000 for grants and $1,202,200 for interagency agreements.

This request reflects a net increase of $1,432,600 and a decrease of 9 positions. This net increase is composed of (1) a $2,000,000 and 2 position increase for the public health initiative which will examine exposure and dose problems and determine specific health effects on populations-at risk and (2) a decrease of $568,000 and 11 positions reflecting reduced animal toxicology studies on emission products from new catalyst control systems and in vitro testing of diesel products as critical FY 1979 regulatory timeframes have been satisfied.

Following review of existing epidemiological data on occupational and public exposure to diesel emission products, a determination will be made as to the conduct of field studies, and if determined appropriate a study will be initiated on one population. The characterization of emissions will continue for some light-duty diesel vehicles. Animal toxicologic studies on diesel emission products will provide a broader base for addressing uncertainty over whether certification of diesel engines should be withheld. Studies will be undertaken to develop techniques for exposure measurement. Such techniques will be used for measuring exposure to both whole exhausts and fractions of exhausts from a variety of engines. A limited number of locations where diesel-powered vehicle traffic is substantial will be monitored. Efforts will be directed to developing techniques to measure the health effects on commuters and roadside pedestrians/residents exposed to motor-vehicle related pollutants.

The increase in this program will be used for the public health initiative in 1980 and includes:

1. Initiation of extensive and comprehensive epidemiological studies of health effects from mobile source emissions.

2. Initiation of laboratory studies of the dose and metabolism of selected emission components thought to be potentially harmful.

3. Development of new devices and techniques for monitoring ambient air exposure to mobile source emissions.

HEALTH EFFECTS - CRITERIA POLLUTANTS

1978 Accomplishments

In 1978, this program had $3,718,000 and 62 positions of which $945,300 was allocated to grants and $885,700 to contracts. Major accomplishments are listed below.

An epidemiologic study was performed in Los Angeles to evaluate the health effects of photochemical oxidants on asthmatics, patients with chronic bronchitis, athletes, and outdoor workers. A report of the results is expected by spring 1979, and selected portions will be submitted to scientific journals for publication.

A study was completed in Los Angeles, California, to determine whether photochemical air pollutants have the potential to cause chromosome breakage in exposed individuals and whether chromosome changes could be used as a biological indicator of exposure to these pollutants. Results of this study reveal that chromosomal abnormalities do not seem to be a sensitive indicator of environmental air pollution exposure.

Developmental studies were begun to assess the mobility of populations near fixed air-monitoring sites and to improve methods of statistical analysis for subsequent epidemiology studies. These studies have now been combined with a related health effects study and data collection for all of these studies is now underway.

Four groups of controlled human exposure (clinical) experiments were completed to assess the effects of ozone on human physiologic parameters. Included in the findings was evidence that exercise is one of the major determinants of physiologic response to ozone. Evidence was also found that, in healthy subjects, decrements in pulmonary function due to ozone exposure are no longer found after 3 to 4 days of ozone exposure.

Animal inhalation exposure studies were performed to assess the effects of short-term exposure to nitrogen dioxide alone and in combination with ozone. The combination was found to have additive effects on increasing susceptibilty to infectious respiratory disease. Data generated from variable exposures to these gases both with and without the added stress of elevated temperature will support chronic exposure studies in FY 1979.

In another animal study, exposures to low concentrations of ozone or nitrogen dioxide increased sleeping time in mice injected with barbiturates. This study indicates that low concentrations of these pollutants have systemic effects which may be related to how the body handles other chemicals.

1979 Program

The 1979 resources for health effects research on the criteria air pollutants are $1,837,300 and 24 positions. Approximately $185,000 is being spent on grants and $167,000 on contracts. The 1979 program is described below.

The Clean Air Act as Amended, 1977, requires that standards established for air pollutants be reviewed at 5 year intervals. This program continues to provide current scientific data as a basis for maintenance or revision of those standards. The program for FY 1979 includes animal toxicology and controlled human exposure (clinical) studies which assess the adverse health responses associated with exposure to one or more criteria pollutants. Animal and human studies will first focus on effects resulting from exposure to combinations of ozone and sulfur dioxide. These studies will be followed by similar ones on the effects of exposure to carbon monoxide and nitrogen oxides. The animal studies will employ various combinations and exposure times to identify additive or synergistic effects on the respiratory system. The clinical studies will address the effects of short-term exposure to the same combinations of criteria pollutants on healthy volunteers and on those in whom asthma-like respiratory airway reactivity has been simulated pharmacologically.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$162,700 results from two actions. A net increase of +$85,200 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$247,900 was reprogrammed within this activity to health effects/transportation sources.

1980 Plan

In 1980, $6,800,000 and 31 positions are requested for health effects research on criteria air pollutants. This includes approximately $1,998,000 for contracts, $2,241,900 for grants, and $450,000 for interagency agreements. This request reflects an increase of $4,962,700 and 7 positions. These resources will be used primarily to meet the requirements of the Clean Air Act as Amended, 1977. The entire increase is used for the public health initiative effort.

The public health initiative effort includes, along with work in Health Effects--Non-Criteria pollutants, methodology development studies for improving measurement of adverse health effects and relating those effects to better measurements of pollutant exposure for animal toxicologic and human clinical studies. Additional studies will employ the new methods developed in better models of healthy and imparied animal and human airway, pulmonary, and skin defense mechanism function. More sensitive and more rapid

methods for detection of bio-chemical, genetic, and immune changes will be employed; and research will address chromosomal damage, mutagenicity, and carcinogenicity as well as other toxic effects of air pollutants. Further methodology development studies for epidemiologic research are also included in the Public Health Initiative work, and these are described in more detail in the Health Effects--Non-Criteria -- pollutants budget section.

The 1980 base program includes expansion of FY 1979 animal toxicologic and controlled human exposure (clinical) studies. These studies concern adverse health effects from short-term exposures to combinations of criteria pollutant and are performed upon normal subjects and upon those in whom asthma-like respiratory airway reactivity has been simulated pharmacologically. Biochemical, immunologic, and cardiopulmonary physiologic parameters are examined prior to, during, and following pollutant exposures. Epidemiologic studies will be initiated to assess adverse human health effects from exposure to ambient concentrations of criteria pollutants in areas which approach but have not achieved compliance with National Ambient Air Quality Standards.

HEALTH EFFECTS/NONCRITERIA--AIR

1978 Accomplishments

In 1978, the program had $6,621,100 and 87 positions of which $3,954,000 was spent on contracts, $622,500 on interagency agreements, and $349,800 on grants. Listed below are the major accomplishments.

- A pilot human exposure (clinical) study was completed to assess the acute effects of exposure to sulfuric acid in a size range of approximately 0.3 micrometers diameter and concentrations which ranged from 50 to 200 micrograms per cubic meter. No significant decrements of pulmonary function were observed in test subjects.

- The Clinical Laboratory Evaluation and Assessment of Noxious Substances (CLEANS) aerosol facility was completed and tested, thereby giving the Agency the capability of generating water soluble particles over a wide size and concentration range for human exposure studies.

- Animal inhalation exposure studies were performed to assess the effects of sulfuric acid in two size ranges, 0.3 micrometers and 0.05 micrometers diameter, alone and in combination with manganese particles on normal animals. The data failed to indicate that toxicity was related to particle size.

- In additional animal studies, protective lung cells were exposed *in vitro* to metal-coated fly ash particles, and it was found that toxicity increased as particle size decreased.

- An epidemiologic study was performed in Dallas to determine the adverse health effects of exposure to low-level traffic density (less than 30,000 cars per day) on blood lead levels. (Equivalent air exposures were less than 1.5 to 1.6 micrograms per cubic meter of lead). No effects were found.

- The *Salmonella typhimurium*/mammalian activation mutation assay was implemented and work with complex environmental mixtures (diesel exhaust extracts) was started. The whole-cell activation system may be combined with the Ames test to provide a more accurate reflection of biological effects in the intact animal. This is particularly valuable for evaluation of macrophage reaction to respirable particulates.

- The geographic distribution of increased lead absorption as measured by deciduous tooth lead levels were studied in Cleveland children. The teeth of some children from suburban neighborhoods were found to contain lead levels as high as those in the teeth of some children from inner city neighborhoods.

- An autopsy study was performed in Dallas on white males in six ten-year age ranges (0-9 to 50-59) in an attempt to determine normal cadmium levels in urban Americans. Findings showed that kidney cadmium concentrations increased with age, up to age 50, and that human cadmium levels in America are higher than those in Sweden but lower than those in Japan.

- The data collection phase was completed in four of five areas for an epidemiologic study to assess the trace metal body burdens of residents living in the immediate vicinity of five non-ferrous smelters. This study will continue to completion in the fifth area and results will be analyzed for reporting.

- The data collection phase was completed for an epidemiologic study in St. Louis to assess the short-term effects of multiple pollutants on pulmonary function of outdoor workers. Analysis of these results is being performed and a report is expected later in 1979.

1979 Program

The 1979 resources for health effects research on non-criteria air pollutants are $10,458,300 and 118 positions. Approximately $4,609,700 will be spent on contracts, $608,000 on grants, and $460,000 on interagency agreements. A description of the program is presented below.

The program for FY 1979 focuses on animal toxicology, controlled human exposure (clinical) and epidemiologic studies to assess the health effects associated with particulate matter as a function of size and chemical composition. Studies of the effects of combinations of pollutants on animal models are continuing with emphasis on sulfates, metallic oxides, and other particulates alone and in combination with ozone, nitrogen dioxide, and sulfur dioxide.

Epidemiologic studies on the effects of airborne particles including sulfates are being conducted on target populations including school children, adults with chronic respiratory diseases, and asthmatics. Epidemiologic studies of populations exposed to trace metals near smelters and of outdoor workers exposed to multiple pollutants are being completed and the effects of trace metal inhalation are also being studied through animal toxicology.

Controlled human exposure (clinical) studies are being performed on the effects of characteristic ambient levels of liquid aerosol fine particulate pollutants, alone and in combination with ozone, nitrogen dioxide, and sulfur dioxide. Both normal subjects and those with pharmacologically defined reactive airways are being studied resting, exercising, and stressed with heat and humidity.

1979 Explanation of Changes from Budget Estimate

A net increase of +$2,341,300 resulted from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$150,000. A net increase of +$430,900 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan +$2,060,400 was reprogrammed to this activity from industrial processes ($539,900), characterization and measurement methods development ($80,800), and quality assurance ($340,000) within the air medium, and from transport and fate ($13,200), health effects ($860,900), and marine ecological effects ($225,600) within the water quality medium.

1980 Plan

In 1980, $17,305,000 and 136 positions are requested for health effects research on non-criteria air pollutants. This includes approximately $7,336,000 for contracts, $1,781,600 for grants, and $1,362,400 for interagency agreements. This request reflects an increase of $6,846,700 and 18 positions. These resources will be used primarily to meet the requirements of the Clean Air Act as Amended, 1977. The entire increase is for the public health initiative.

As part of the base program, animal toxicologic studies and controlled human exposure (clinical) studies begun in FY 1979 will continue. These studies involve short-term (human and animal) and long-term (animal) exposure to particulate air pollutants, including sulfates and metallic oxides, alone and in combination with ozone, nitrogen dioxide, and sulfur dioxide. Both normal subjects and those simulating disease with pharmcologically defined reactive airways will be studied. In addition, further studies on the toxic effects of trace metals will be performed using animal systems.

Epidemiologic studies, also in the 1980 base program, will evaluate the adverse health effects of target populations from exposure to ambient airborne particulate matter, including various sulfate and nitrate compounds, to determine the relationship of particle size and composition to observed effects. Additional studies will be performed to evaluate observed health effects during emergency air pollution episodes.

Our increased resources are devoted to initiative, which will focus on methodology development studies for improving the capabilities of epidemiologists to measure adverse health effects from air pollutants and to relate these effects to better measurements of exposure. Epidemiologic studies will then be performed using the new methods developed to measure adverse health effects from exposure to pollutants indoors; to rural and urban dusts; and to pollutants near industrial sources such as power plants, petrochemical plants, and steel mills. These improved methodologies and studies will provide much needed capabilities for determining dose-response relationships for populations exposed to ambient levels of air pollutants. Further methodology development studies for animal toxicologic and human clinical research are also included in the Public Health Initiative work, and these are described in more detail in the Health Effects--Criteria pollutants budget section.

ECOLOGICAL EFFECTS

1978 Accomplishments

The 1978 resources for ecological effects research were $1,783,900 and 24 positions. Of this total $302,700 was spent for contracts, $70,000 for interagency agreements and $415,500 for grants. Major accomplishments are listed below:

Field and laboratory studies indicated that biogenic emissions of hydrocarbons from indigenous vegetation contributes to background pollution loading. Three such emissions, isoprene, terpene and monoterpenes, can be a significant source of reactive hydrocarbons in rural areas.

The field experimental phase of a study of photochemical oxidant impact on San Bernadino, California forests was completed. The results indicated that urban pollutants cause tree kill, stunt growth and otherwise disrupt the forest community.

Studies on photochemical oxidant effects on agricultural crops and selected forest species indicated decreased productivity potential and quality alteration.

A study of some agricultural crops showed no yield reduction when crops were subjected to constant non-variable sulfur dioxide concentration; however, they did show a yield reduction when subjected to varying concentrations. This indicates that fluctuating levels of pollutants are capable of causing the most serious crop damages. Under controlled laboratory conditions, it was found that median concentrations were a better predictor of crop yield losses. It was found that sulfur dioxide inhibited growth and nitrogen fixation in alfalfa. Conifers in the dormant stage, exposed to sulfur dioxide, showed subsequent foliar injury and growth suppression.

Another study found that ozone at chronic low levels caused a reduction in biomass and in metabolites of pine seedlings and reduced nitrogen fixation and biomass in alfalfa, an indicator plant.

Combinations of ozone and sulfur dioxide were found to cause more foliar injury and growth reduction in agricultural crops than when applied singly. This implies that pollutant combinations should be considered when developing control strategies or setting standards.

Studies indicated that acid mist and fluorides cause vegetation damage which may result in decreased biomass, quality and economic loss. Sources contributing to these pollutants may require regulations.

Studies have shown that heavy metals and other toxic pollutants decrease decomposition rates and adversely affect other soil system processes. They also accumulate in food crops and may reduce nitrogen fixation.

1979 Program

Resources for ecological effects research in 1979 are $1,538,900 and 5 positions. Approximately $410,000 is being spent for contracts, $54,000 for grants and $40,000 for interagency agreements.

The 1979 program will continue to evaluate ambient air quality standards in order to provide a sound basis for establishing standards.

Criteria pollutants are receiving major attention through field, greenhouse and laboratory studies investigating the effects of sulfur dioxide, ozone and nitrogen dioxide on economically important agricultural crops and tree species. Emphasis is being placed on investigations relating to input of non-criteria pollutants, such as hydrocarbons and heavy metals and other similar toxicants, on plant productivity, nutritional quality and soil systems. The study of photochemical oxidant effects on forest systems in Sourthern California is to be completed. Other oxidant studies will continue to relate pollutant concentrations to vegetation damage. Work on biogenic emissions of hydrocarbons, on halogen gases, on heavy metals and on development of methodologies continues. Some economic assessments of pollutant impact will also continue.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,109,100 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$1 million. A net increase of +$17,800 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$126,900 was reprogrammed within this activity to health effects/transportation sources.

1980 Plan

In 1980, $2,266,000 and five positions are requested. This reflects an increase of $729,100 over 1979. The increase will be used to emphasize effects assessment of gaseous airborne pollutants, and efforts on non-criteria pollutant impact. These resources include approximately $1,379,400 in contracts, $187,300 in grants and $136,300 in interagency agreements.

Research emphasis will be placed on the effects of criteria pollutants in order to evaluate the adequacy of secondary air quality standards and provide the ecological basis for refining and updating existing criteria and standards. Research will also support decisions relating to regionalization of standards and/or prevention of significant deterioration.

Investigations are aimed at detecting, understanding and predicting the impact of air-borne pollutants on terrestrial ecosystems (natural systems and agricultural crops). This includes assessments of the biotic and aboitic components, the related pollutant interactions on processes and the potential impact on human health or welfare. Research findings will relate air pollutant concentrations to damage potentials in the environment by assessing pollutant perturbations and effects and bioaccumulation in terrestrial ecosystems and in food chairns. Studies will encompass pollutant sources, emissions, air quality deterioration potential, and other discharges which alter environmental conditions and subsequently effect terrestrial systems.

Extramural research will be expanded to laboratory and field assessments of the acute and chronic, low level effects of photochemical oxidants (ozone, PAN), sulfur dioxide and nitrogen oxides. Studies will be conducted on pollutant interactions as related to agricultural crops and natural ecosystems to determine the impact on productivity, food quality, and economic implications. Oxidant stress on deciduous forests will be initiated and chronic exposure studies, using criteria pollutants and carbon monoxide, will define minimum allowable doses. Zonal air pollution systems will be refined and tested for use on agricultural crops on a national basis.

Toxic gases (polyaromatic hydrocarbons), particulates, selected carcinogenic compounds and heavy metals accumulating in the food chain will be investigated. Other studies will include the effects of hydrocarbons (biogenic emissions) heavy metals and halogen gases on flora, fauna and soil systems.

Synergistic reactions of pollutants coupled with biological processes, environmental factors and interactions within the soil ecosystems will also be evaluated.

The above studies will be used to (a) develop a scientific basis for air pollution control strategies; (b) establish and strengthen secondary air quality standards and (c) establish a basis to evaluate the role of soils and vegetation in prevention of significant deterioration of air quality. This research supports the "welfare effects" mandate of the Clean Air Act Amendments, Section 127(a) as revised.

TRANSPORT AND FATE

1978 Accomplishments

In FY 1978 resources were $10,830,700 and 34 positions. This included $3,535,100 in contracts, $2,769,000 in grants, and $2,662,400 in interagency agreements.

The first major field study in the STATE (Sulfur Transport and Transformation in the Environment) program was conducted during the month of August 1978 on TVA's Cumberland Power Plant. Using fully instrumented aircraft and mobile vans the coherent power plant plumes were tracked for distances up to 410 kilometers downwind. The chemical and meteorological data collected during the power plant plume studies will be used for the development and validation for sulfur dioxide/sulfate air quality models.

Five comprehensive air quality simulation models (AQSMs) have been carefully evaluated for future verification studies. These AQSMs have been developed to predict ambient sulfate and oxidant levels in urban atmospheres. Some of these AQSMs, with proper modification, may have potential use for air quality prediction at the regional scale.

The first phase of the Houston air quality field study has been completed. Ambient measurement data were collected on major photochemical pollutants such as oxidants, aerosols (including sulfates), nitrogen oxides, and hydrocarbons.

A historical study was conducted on visibility trends in the Northeast. It concluded that visibility in the Northeast had declined significantly during the past 25 years especially in the non-urban locations where major visibility declines of 10-40 percent were observed. The urban/suburban areas showed smaller visibility decline on the order of 5 percent.

A trend analysis study was conducted on historical air quality data measured in the Los Angeles area. The preliminary findings of the study indicated that while decreases in ambient hydrocarbon levels could be associated with a slight lowering of the nitrogen dioxide levels, the major reductions in nitrogen dioxide were seen with the lowering in ambient levels of oxides of nitrogen.

1979 Program

The 1979 resources level for air transport and fate research is $10,949,300 and 44 positions, These resources include approximately $3,041,600 in contracts, $3,257,000 in grants, and $2,417,000 in interagency agreements. The 1979 program reflects an increased emphasis on the following high priority subject areas:

Atmospheric Particulates: Uncertainty continues to exist concerning the composition, distribution, and probable sources of atmospheric sulfate and other particulate matter associated with human activity. The program on atmospheric sulfates is designed to eliminate these uncertainties, particularly with respect to the role of photochemistry in the formation of sulfates; the relative contribution of tall vs. short stack sulfur dioxide sources to ambient sulfate levels; and the visibility reduction associated with anthropogenic sources of atmospheric sulfates and other fine particulates. The STATE program, in its second year, is directing a good portion of its resources to processing and analysing the extensive body of data collected during its TVA power plant plume studies conducted in the summer of 1978. In addition, work is being conducted on characterizing the chemical and physical properties of inhalable particulate matter (particles sized 15 microns and less).

Photochemical Oxidants: Emphasis is being placed on determining the sources, distribution, and atmospheric chemistry of photochemical oxidants. Special studies are being conducted to determine the role of natural vs. manmade sources; the impact of long range transport and the interrelationships of nitrogen oxide, hydrocarbons and oxidants, and specific hydrocarbon reactivities associated with precursors of oxidants.

Urban Field Studies: The Houston field study, in its second year, is devoting most of its resources to the analysis of the field study data on aerosols and oxidants collected in the summer 1978, and to the acquisition of an emissions data base.

Halocarbons: Investigations are being made of the impact of manmade and naturally occurring halocarbons on stratospheric ozone. The halocarbon research is focusing on tropospheric sources, dispersion, and reactions and stratospheric sinks. The role of atmospheric levels of OH radical in moderating tropospheric lifetimes of halocarbons is receiving further attention.

Air Quality Simulation Models (AQSMs): With the aerometric data base on pollutant concentrations and meteorological parameters collected during the operation of the Regional Air Pollution Study in St. Louis, a variety of Air Quality Simulation Models (AQSMs) are being verified for accuracy and precision. These photochemical AQSMs will be used to help predict urban oxidant and sulfate pollution levels under various sulfur dioxide and photochemical oxidant precursor emission control strategies. Some of these urban AQSMs will be modified to address the problems of regional or multi-state transport and transformation of air pollutants.

1979 Explanation of Changes From Budget Estimate

The net decrease of -$147,700 results from several actions. A net increase of +$156,200 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of the gency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$303,900 was reprogrammed within this activity from transport and fate to health effects/transportation sources.

1980 Plan

The 1980 resources proposed for air transport and fate are $13,010,000 and 44 positions. This is an increase of $2,060,700 over 1979. These resources include approximately $3,642,800 in contracts, $3,890,000 in grants and $2,888,200 in interagency agreements.

The 1980 program is essentially a continuation of the 1979 plan with emphasis, as a result of the increase, on predicting pollutant concentrations in complex or rough terrain. It will continue to support research on determining the transport, transformation and removal processes of regulated and important nonregulated pollutants with major emphasis on oxidants, sulfates, halocarbons selected organics, nitrates and particulate matter (including inhalable particulate matter).

The STATE program will conduct a major regional field experiment called PEPE (prolonged elevated pollution epiosdes). Unlike the previous STATE studies which focused primarily on individual power plant plumes, PEPE will expand the field program activities to a larger region where both urban and power plant plumes become well mixed. In PEPE, which is scheduled for summer 1980, areas of pollution episodes on the order of 300 kilometers in diameter will be tracked physically and chemically over several days as they move thousands of kilometers. In order to study this phenomenon, EPA and NASA are planning a joint program to develop improved techniques for ulitizing satellite imagery to study the structure and movement of the polluted air mass.

In the area of air modeling research, a greater emphasis will be placed on the development of AQSMs which can be used to predict the regional transport and transformation processes of pollutants such as oxidants and sulfates. One of the modeling areas which will be accelerated as a result of the 1980 increase, is the work on AQSMs that can be used to predict pollutant concentrations in complex or rough terrain. Since many of the current and projected locations of power plants are found in hilly and mountainous areas, there is a need to develop types of AQSMs which can provide reliable and accurate pollutant concentration predictions for assessing abatement control strategies.

The Houston air quality field study will be in its third and final year. The results of the field program are expected to provide useful information on the pollutant and meteorological conditions that lead to elevated oxidant and particulate levels.

The research on photochemical oxidants will address major uncertainties associated with the long range transport of ozone, hydrocarbons, and nitrogen oxides. Research will attempt to determine natural contributions to ozone and the role of hydrocarbon reactivity in producing ozone. Smog chambers will be used to simulate atmospheric photochemical oxidant chemistry to quantify the role of aromatic hydrocarbons and the impact of multi-day irradiations on ozone formation. The work on nitrogen oxides will focus on their role in the formation of photochemical oxidants and the relationship of nitrogen oxide emissions to ambient nitrogen dioxide. This latter information will be important in assessing the adequacy of control measures related to the pending short-term National Ambient Air Quality Standards for nitrogen dioxide.

AIR
Research and Development

Industrial Processes

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Industrial Processes. . . .	$5,691	$5,000	$4,531	$4,050	- 481
Permanent Positions					
Industrial Processes . . .	22	21	20	18	-2
Full-time Equivalency					
Industrial Processes	...	...	36	31	-5

Budget Request

An appropriation of $4,050,000 and 18 positions is requested for fiscal year 1980. This represents a decrease of $481,100 and two positions. The decrease reflects reduced emphasis on both the generation of data for developing new source performance standards and on assisting Regional offices to evaluate new soure permit applications. The major portion of this program's resources will be used to support implementation of the Clean Air Act Amendments of 1977.

Program Description

The industrial air processes program is primarily an extramural effort that responds to legislative mandates of the Clean Air Act. The overall objective is to assess industrial air pollution emissions and to develop and demonstrate pollution control technologies capable of reducing or eliminating potentially hazardous and toxic pollutants emissions from industrial point sources. Outputs provide technical and cost data bases which support regulatory standards development and provide industry with environmental control options. Emissions under study are those primarily found in the following industries: chemical processing, agrichemicals (fertilizers and pesticides), textiles, pulp and paper, metal fabrication and finishing, metal and mineral production, petroleum refining, and storage segments, as well as those emissions resulting from hazardous material incidents.

1978 Accomplishments

In 1978 resources for this program were $5,691,000 and 22 positions. Obligations included $3,999,000 for contract support, $515,800 for grants and $165,000 for interagency agreements. In 1978, the program focused on assessing the nature and quantity of toxic and other hazardous pollutants emitted from industrial sources. This information, together with data on the ability to control these pollutants, provides the basis for future regulatory actions. In addition, several development and demonstration projects on criteria pollutant control were continued as well as efforts to transfer demonstrated foreign technology for particulate control to corresponding local industrial sources. Major activities performed include the following:

- Atmospheric emission data were collected at several integrated oil refineries. Data on nine refineries were analyzed and emission factors for fugitive sources transferred to Office of Air Quality Planning and Standards (OAQPS) for their use in regulation development.

- Data on uncontrolled (fugitive) emissions were collected on petrochemical processes for chlorobenzene, butadiene, dimethyl terephthlate and ethylene oxide/glycol.

- Assessments to determine the risk of air emissions were completed for the manufacture of acetone and phenol from cumene, chloronated hydrocarbons manufacture, and natural gas processing.

- Assessments of emission control technology were completed for acrylonitrile plants and the loading of gasoline barges.

- Six initial surveys were completed in an interagency study with NIOSH to determine air pollution control needs in pesticides manufacturing facilities.

- Results of an extensive evaluation of pilot scale technology for controlling basic oxygen furnace charging emissions were published.

- A detailed assessment of emissions and emission control technology for blast furnace casting operations was completed.

- Tests of the combined sinter plant windbox/gas recycle-gravel bed filter system were completed. These tests showed a substantial reduction in the emission of pollutants.

- Major technology innovations that significantly reduce fugitive emissions from secondary nonferrous plants were identified and documented. This program characterized available control technology to support the attainment of OSHA and EPA goals for reduction of lead as an air contaminant.

- The severity of air emissions from asphalt hot mix industry was assessed.

- A new hydrocarbon scrubbing technology, surfactant enhanced scrubbing (SES), was developed to pilot scale. The system uses surfactants to enhance removal of air contaminants at a lower cost and with less energy than conventional emission control systems.

- State-of-the-art documents were prepared for the following processes in the organic chemicals, polymer and related industries:

  Rubber Processing
  Plastics Processing
  Malaeic Anhydride
  PVC Production
  Acrylic Acid Manufacture
  Solvent Reclaiming

- Foreign control technologies were evaluated for potential application to U.S. problems; including optimization of the Hoboken converter for fugitive converter emissions control (Poland); characterization of advanced arsenic triozide control systems (Canada); and control technology options for lead blast furnaces (Yugoslavia).

- The air pollutants emitted from coal storage piles and the potential environmental effects of this emission source were assessed.

1979 Program

The 1979 resource level for this activity is $4,531,100 and 20 positions. These resources include approximately $2,550,700 in contract support, $608,900 in grants and $150,000 in interagency agreements. The primary objectives to be accomplished are: (1) to define and provide solutions to a few critical emission sources known to have detrimental effects on human health and the environment, such as those identified in pesticide manufacturing and nonferrous smelting; (2) to accelerate acceptance and implementation of technological advances by absorbing the risk of demonstrating fugitive emissions control in steel and glass manufacturing and secondary lead; and (3) to maintain a current awareness of international technological developments--processing and control--across 19 major

- Assess and monitor the manufacturing operations for four pesticides (atrazine, trifluralin, alachlor, carbaryl), four petrochemicals (benzene, methylethylketone, methylisobutylketone ethylene oxide), and four organic chemicals (vinylidene chloride, styrene, nitrobenzene, halomethanes).

- Demonstrate lime/limestone scrubbing for smelting sulfur-bearing nonferrous ores.

- Characterize volatile emissions (arsenic, lead and cadmium) and their control from copper, lead, and zinc smelters.

- Demonstrate carbon adsorption for control of petroleum solvent emissions and solvent recovery for an industrial dry cleaning facility. This work, being done at the request of the OAQPS, will be the basis for regulation of the industry.

- Determine the state-of-the-art for emission control from printing and other operations in the flexible packaging industry; characterize emission source types; initiate a program to demonstrate control technology for reduction of organic solvent emissions.

- Evaluate improved, solventless coating technologies for furniture manufacturing for inertness and product acceptability. These results will assist the Office of Air Quality Planning and Standards to set lower emission limitations for volatile organics.

- Measure volatile chemical emissions from wastewater treatment basins. This program, developed for the draft pulping industry, will provide a data base and sampling methodology for other industry segments.

- Make an environmental assessment of the cotton ginning industry.

- Demonstrate one coating process alternative to reduce organic discharges from automobile manufacturing operations.

- Complete source assessment work on toxic air emissions for the textile industry and implement bench scale activity for hydrocarbon removal.

- Demonstrate technology for control of hazardous particulates from glass industry furnaces.

- Develop an approach for evaluating the cost and capabilities of alternatives for controlling hydrocarbon emissions from solvent uses, such as dry cleaning operations.

- Conduct an environmental assessment of coal preheaters.

- Demonstrate surfactant scrubbing for auto painting operations.

- Characterize technologies for control of fugitive lead emissions from secondary lead facilities through an interagency agreement with NIOSH.

- Optimize baghouse performance for control of asbestos emissions.

- Evaluate, at pilot scale, four flue gas cleaning techniques to remove SOx and trace metals from metallurgical offgases.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$468,900 results from two actions. A net increase of +$71,000 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1980) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$539,900 was reprogrammed from this activity to health effects/non-criteria pollutants within the air medium.

1980 PLAN

The requested 1980 level for this program is $4,050,000 and 18 positions which includes approximately $2,150,000 in contract support, $650,000 in grants and $100,000 for interagency agreements. A major problem in the attainment and maintenance of Ambient Air Quality Standards at the present time is the problem of oxidants. The program emphasis in 1980, therefore, is the characterization and control of hydrocarbon emissions which are precursors to oxidant formation. The 1980 decrease of $481,100 and two positions reflects less emphasis on the generation of data for developing new source performance standards; i.e., fewer source categories and on assisting Regional offices to evaluate new source permit applications.

To achieve currently unmet Ambient Air Quality Standards for oxidants, State Implementation Plans (SIP's) will need to be revised. Before the Agency can fully assist in the development and evaluation of these new SIP's, critical information gaps in current emissions inventories must be filled. To satisfy this requirement, an industrial air emissions characterization program will be undertaken in the following high priority areas:

- Point-source emissions from approximately eight Volatile Organic Chemical (VOC) storage and handling sites will be characterized to determine their contribution to total VOC emissions rate. Specific chemical compound identification will be included. Test sites will be selected to enable a nationwide estimate of all emissions made by these storage and handling sites.

- A cost-benefit-risk model will be developed with supporting emissions data for use in decision making on the advisability of regulating various sources of potential carcinogenic emissions as well as other chemicals from coke making operations.

- A capture device for volatile organic emissions from automotive tire curing will be demonstrated. This is needed for NSPS development.

- Applicability of surfactant enhanced scrubbing (SES) to control emissions from paint-bake ovens in automotive and/or other industries will be demonstrated.

- The drum mix dryer for asphalt hot mix industry will be evaluated.

- Industrial applications of activated carbon for hydrocarbon control in organic chemical and related industries will be evaluated.

- Data to determine the cost effectivness of various emission reduction and collection options as an approach to VOC control for metal finishing will be developed.

- Data to determine the cost-effectivness of various maintenance options as an approach to controlling fugitive VOC emssions from refining, petrochemical and organic chemical facilities will be developed.

- Further quantification of VOC emission rates to identify the incremental addition of oxidant-producting chemicals from aeration systems at industrial wastewater treatment plants will be completed.

- Sophisticated instrumentation systems to maximize exhaust of solvent concentrations from curing ovens, paint application booths, and other solvent use industries to approach the lower explosion limit will be designed and tested experimentally.

- Guidelines to be used by the Office of Enforcement in its monitoring program of fugitive VOC emissions will be developed, tested and published.

The Office of Air Quality Planning and Standards (OAQPS) estimates that of the 100 New Source Performance Standards planned for promulgation during the next four years, at least 25 will have inadequate Best Available Control Technology (BACT). High priority control technology development and testing programs will therefore be undertaken as follows:

- Control Technology development programs will be initiated for four critical industrial source categories which will be identified by OAQPS as having inadequate BACT.

- Performance evaluations of retrofit pilot-scale collection technologies such as carbon adsorption and catalytic incineration will be conducted at coil, web, and sheet coating facilities, textile finishing facilities, paint-bake ovens, and selected petrochemical sites.

- Technologies to control emissions will be developed and refined with the emphasis being on potential carcinogens from coke manufacturing processes.

- Technologies for control of emissions from solvent and gasoline loading operations for barges and rail cars will be developed and tested.

- Demonstrations of new and retrofit technology for dust suppression and fugitive emission controls at secondary lead smelters will be conducted through an interagency agreement with NIOSH.

Research and Development

Monitoring and Technical Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Characterization and Measurement Methods Development	$5,754	$7,186	$6,081	$8,533	+$2,452
Monitoring Methods and Systems	230	4,450	4,534	4,650	+116
Quality Assurance	1,613	4,901	4,151	4,901	+750
Technical Support	2,986	3,561	3,316	3,205	-111
Total	10,583	20,098	18,082	21,289	+ 3,207
Permanent Positions					
Characterization and Measurement Methods Development	53	62	63	63	-
Monitoring Methods and Systems	6	21	21	21	-
Quality Assurance	38	43	44	44	-
Technical Support	56	36	37	32	- 5
Total	153	162	165	160	- 5
Full-time Equivalency					
Characterization and Measurement Methods Development	...	...	60	69	+ 9
Monitoring Methods and Systems	...	...	34	25	- 9
Quality Assurance	...	...	47	45	- 2
Technical Support	...	...	43	47	+ 4
Total	...	...	184	186	+ 2

Budget Request

The 1980 budget request for monitoring and technical support is $21,288,500 and 160 positions. This is a net increase of $3,206,700 and a decrease of 5 positions. In the characterization program an increase of $2,452,200 will provide for the continuation of research on the potential problems of the manufacture and use of graphite fibers and graphite fiber composite materials which was started in 1979, as well as an acceleration of research on measurement techniques for inhalable particulate matter. An increase of $116,400 will be utilized to improve the national air monitoring network and to continue development, operation, and expansion of an experimental national monitoring network for inhalable particulates. Also $749,700 will be devoted to providing additional quality assurance development and support for on-site evaluations of State, local and National air monitoring stations and networks and for the inhalable particulate network. The technical support program is being decreased by $111,600 and five positions.

Program Description

The Air Monitoring and Technical Support Program consists of four major components: (1) characterization and measurement methods development for measuring pollutants from sources and in ambient air, (2) monitoring methods and systems development to fulfill operational monitoring requirements, (3) the development and provision of quality assurance procedures and materials to assure monitoring data validity, and (4) the provision of technical support to Agency regulatory and Regional Offices. Each of these components is discussed below.

The output of the characterization and measurement methods development program is new and/or improved methodology and instrumentation technology which will be utilized in stationary source, mobile source, and ambient air quality research, and which will provide the basis for required reference and monitoring methods.

A major program activity is the development of sampling and analysis techniques for identification and measurement of pollutants from stationary sources. Work in this area focuses on the development of sampling procedures and associated instrument requirements for impending new source performance standards and improvement of techniques associated with existing new source performance standards, e.g., the development of improved sampling procedures for continuous in-stack monitoring of particulate matter. Additional work is carried out on the identification of stationary source pollutants and in the support of stationary source compliance activities.

Another major program activity is the development of sampling and analysis techniques for identification and measurement of pollutants from mobile sources. Integral to this development work are characterization studies which describe gaseous and particulate emissions from advanced power systems for light duty vehicles. Characterization studies are also carried out to determine the composition of aircraft particulate emissions and the effects of emission control systems on the quality, size distribution, and composition of those particulate emissions.

Sampling and analysis techniques for the identification, characterization, and measurement of pollutants in ambient air is the third activity. New and improved analytical techniques for criteria and noncriteria pollutants in ambient air are developed. This area of research also includes studies characterizing urban and rural atmosphere for a variety of important gaseous and particulate pollutants including: ammonia, sulfates, formaldehyde, polynuclear aromatics, nitrates, and organic acids.

The air monitoring methods and systems program supports the testing evaluation, and demonstration of measurement systems for monitoring specific pollutants in ambient air and emissions from stationary sources. The program assures the availability of monitoring methods for the measurement of all regulated pollutants at or below the concentration levels of interest, and for measurement of unregulated pollutants at levels of interest specified by the EPA's regulatory offices.

The quality assurance program serves the Agency's air monitoring effort through the validation and standarization of monitoring methods, development and provision of quality control materials and procedures for operational use, the conduct of methods and analyst, performance evaluation studies, development of data analysis and data handling systems, and participation in regional quality control workshops.

The technical support program provides assistance to regulatory and regional offices in implementing the mandates of the Clean Air Act. Efforts are applied to special measurement of regulated pollutants for regulation revision and planning as well as measurement of unregulated pollutants such as asbestos, organic chemicals and pesticides and their transformation products. Part of the technical support program is planned as a level-of-effort with resources set aside to allow quick response to unforeseeable, but urgent, requests for services. The program also plans and provides support to operational monitoring in those areas where Regional or program office personnel cannot respond because of the need for specialized expertise or facilities available only in the Office of Research and Development.

CHARCTERIZATION AND MEASUREMENT METHODS DEVELOPMENT

1978 Accomplishments

The 1978 resources for this program were $5,754,000 and 53 positions; including approximately $2,338,200 in contracts, $709,100 in grants and $184,500 in interagency agreements. During FY 1978, the program:

- Characterized the gaseous and particulate emissions from power plants and other sources that burn residual oil containing various amounts of sulfur and vanadium, and found sulfate emissions as high as 10% of total sulfur oxide emissions.

- Evaluated the impact of various catalytic control systems for automotive exhaust emissions (regulated pollutants and sulfuric acid); defined potential problems associated with advanced catalytic control systems; drew attention to the potential release of mutagenic pollutants in diesel exhaust.

- Identified numerous toxic organic compounds being released from the Love Canal Landfill, Niagara Falls, New York.

- Solved long-standing-problems concerning the accurate measurement of sulfates, free acid, and nitrates in ambient aerosols. Demonstrated that high purity quartz filters will provide a significant improvement over commonly used glass fiber filters for sampling particulate nitrate.

- Demonstrated a system for remote optical sensing of emissions capable of measuring concentrations of compounds in the 10ppb in source emissions for pathlengths of 1 km.

1979 Program

The 1979 resource level for characterization and measurement methods development is $6,080,500 and 63 positions. These resources include approximately $2,575,000 in contracts, $683,000 in grants, and $164,000 in interagency agreements. The program in characterization and measurement methods development continues to carry out research related to stationary source performance standards, ambient air quality, and mobile source emissions.

In support of the ambient air quality program, the research focuses on methods for characterizing and measuring sulfates, including specific molecular species such as sulfuric acid, gaseous and particulate nitrates and organics.

In the stationary source area, large sources of sulfate emissions are being studied for their contribution of primary sulfates to the ambient sulfate burden. In addition, work in this area addresses the measurement needs associated with an accelerated New Source Performance Standard (NSPS) schedule as described in the Clean Air Act Amendments of 1977. In addition, characterization studies in power plants and other high sources of sulfur emissions are being conducted to assess their relative contributions of primary sulfate emissions to the ambient sulfate burden.

The mobile sources research program is focused on the characterization of heavy duty vehicle emissions of nonregulated pollutants. Also, emissions from advanced control system -- dual and 3-way catalysts -- are being quantified.

The carbon fiber research program, focuses on characterizing the fiber size distribution and concentration in emissions from manufacturing facilities and evaluation of existing sampling and measurement techniques for monitoring of sources and ambient air. The program also focuses on the development of an information base to allow market analysis and projection of municipal solid waste carbon fiber composition and to evaluate carbon fiber waste impacts and effects in existing and emerging solid waste handling and disposal systems.

For 1979 and beyond, special reporting requirements are congressionally mandated by the Clean Air Act Amendments of 1977. These include reports on particulate emission from heavy duty vehicles, a low nitrogen oxide research vehicle testing program, and an accelerated program of in-stack measurement methods development to match an accelerated timetable for establishment of NSPS.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,105,500 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$800,000. A net increase of +$295,500 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$601,000 was reprogrammed within this activity to monitoring methods and systems ($520,200); and to health effects non-criteria pollutants ($80,800) within this medium.

1980 Plan

The 1980 resource level for characterization and measurement methods development is $8,532,700 and 63 positions. These resources include approximately $3,669,000 in contracts, $939,000 in grants and $256,000 in interagency agreements. An increase of some $2,000,000 in this program will support research on the problems of graphite fibers on accelerate research on measurement techniques for inhalable particulate matter.

All components of the program will emphasize work on inhalable particulate matter and organics, both gaseous and particulate. Work will continue on other pollutants including nitric acid emitted directly from stationary sources.

In this program area the effort to improve sampling and analytical methods for hazardous organic substances will be increased and the characterization of organics in various localities will continue. A personal monitor for selected carcinogens will be developed and evaluated.

In the stationary source segment of the program, there will be an acceleration of the effort to characterize the particle size distribution and chemical composition of source emissions and to develop samplers and monitors for the inhalable size fraction. Also, the organics emitted from various sources will be identified and measurement methods developed for total hydrocarbons emitted and specific organics of concern.

In the mobile source area work will continue on emissions from diesels. Large samples of the organics emitted will be collected and fractionated to allow health effects studies to be conducted. Emission factors will be determined for those identified to be harmful so that the impact of diesels on ambient air may be determined. Studies will be undertaken to identify the diesel fuel precursors which give rise to the harmful organics. Work will continue on the characterization of emissions from advanced automotive power systems, scheduled for use in the 1980's, including turbo-chargers, naturally aspirated diesel and gas turbine engines.

In the carbon fiber program, the evaluation of instrumentation for monitoring carbon fibers in emissions from production, fabrication and disposal facilities will be completed and work to simulate the action of projected processing and disposal operations will be undertaken. At the same time work will also be initiated to develop procedures to generate carbon fiber aerosols and a low-cost sampler to collect carbon fibers at projected ambient concentrations.

MONITORING METHODS AND SYSTEMS

1978 Accomplishments

The 1978 resources sum to $229,800 and six positions. Accomplishments for 1978 included:

- Registration of fuels and fuel additives and preparation of quarterly and annual usage reports.

- Preparation of a draft plan for an experimental national inhalable particulate monitoring network. Equipment requirements for a 25 station pilot network have been identified. Equipment delivery was scheduled for early FY 1979.

- Collection of the initial data for a study of carbon monoxide (CO) intrusion into sustained use vehicles as required by the Clean Air Act Amendments of 1977.

1979 Program

1979 resources for Monitoring Methods and systems sum to $4,533,600 and 21 positions including $1,950,000 for contracts, $570,000 for Interagency Agreements and $100,000 for research grants.

Specific outputs will include:

- Development and operation of a 25 station pilot inhalable particulate network. The resulting data is to be used to guide the establishment of the eventual overall network of 300 stations. An additional 75 stations are being added to the network in 1979 for a total of 100 stations.

- Completion of the measurements for the CO intrusion study and preparation of a report to the Congress.

- Registration of fuel and fuel additives and preparation of required reports.

- Evaluation of visibility measurement methodology to support Prevention of Significant Deterioration (PSD) program requirements.

- Advanced SO_2 monitoring methodology.
- Keys for interpretation of aerial imagery of air pollution; and a standard reference material (SRM) development program with the National Bureau of Standards focusing on organic pollutants and asbestos fibers in air.

1979 Explanation of Changes from Budget Estimate

The net increase of +$83,600 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractural services and monitoring and technical support activities; the decrease applicable to this activity was -$599,000. A net increase of +$162,400 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan +$520,200 was reprogrammed within this activity from characterization and measurement methods development.

1980 Plan

Resources requested for the 1980 Monitoring Methods and Systems program are $4,650,000 and 21 positions of which approximately $2,476,000 will be used for contracts. The additional of $749,700 will be devoted to providing additional quality assurance development and support for on-site evaluation of State, local and National air monitoring stations and network and for the inhalable particulate network.

Major activities and outputs will include:

- Continuing operation and expansion of the experimental inhalable particulate monitoring network.

- Reference methods for measuring inhalable particulates based on the operating experience with the network stations.

- Development/revision of measurement methods for two regulated air pollutants designated by the regulatory office.

- Technical guidelines for maintenance, calibration and siting of continuous air analyzers proposed for use at national, State and local air monitoring stations.

- Field tests and evaluation of the mobile air monitoring van which has been designed and developed to conduct on-site monitoring of airborne non-criteria organic pollutants.

- Regulation and protocol development for the fuels and fuel additive testing program.

- Continuing evaluation of visibility measurement methodology and data collection in National Parks.

- Designing criteria for airborne laser systems for measurement of sulfur dioxide, suspended particulate matter and ozone. Publishing standard operating procedures manual for reference or equivalent methods.

- Development of aerial imagery interpretation keys for areas to be selected by the regulatory offices.

QUALITY ASSURANCE

1978 Accomplishments

The 1978 resources were $1,613,000 and 38 positions of which $490,000 was in contracts and $48,000 was in grants. Program outputs for 1978 included:

- Proposed a standard Federal reference method and a stationary source emission test for lead.

- Standardized and published in the Federal Register, a procedure for calibrating ozone measurement methodologies.

- Completed the evaluation and designation of five equivalent monitoring methods for criteria pollutants.

- Performed evaluation studies for eight ambient air monitoring stations, eight stations monitoring pollution in conection with the Western Energy Program and, two stationary source monitoring stations.

- Developed a minimum quality assurance program for State and local air monitoring stations and for Prevention of Significant Deterioration stations.

- Distributed the first section of Volume III of the Quality Assurance Handbook for Air Pollution Measurement Systems.

1979 Program

Resources requested for quality assurance in 1979 are to $4,151,300 and 44 positions of which $2,229,000 will be for contracts.

Specific outputs will include:

- Evaluation and validation of methodology for monitoring regulated pollutants sulfur dioxide, in-stack particulates, hydrogen sulfide, carbon disulfide, asbestos and carbonyl sulfide.

- Development of procedures for quality assurance of the pilot inhalable particulate monitoring network.

- Evaluation of methodology for monitoring important non-regulated pollutants, such as ambient sulfur acid, sulfates and arsenic.

- Maintenance of present quality control reference materials and the development of new reference materials as required; and

- Validation of equivalent monitoring methods.

1979 Explanation of Changes from Budget Estimates

The net decrease of -$749,700 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$478,000. A net increase of +$68,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$340,000 was reprogrammed from this activity to health effects/non-criteria pollutants within the air medium.

1980 Plan

Resources requested for the 1980 quality assurance program sum to $4,901,000 and 44 positions. This is an increase of $749,700 over the 1979 level and will be devoted to providing additional quality assurance development and support for on-site evaluations of State, local, National air monitoring stations network and for the inhalable particulate network. Of the total approximately $2,050,000 will be for contracts.

Major activities associated with this program include:

- On-site evaluations and audits of State and Local Air Monitoring Stations (SLAMS) and all National Air Monitoring Stations (NAMS).

- Validation of measurement methodologies for up to eight regulated and nonregulated air pollutants including a Federal reference method for inhalable particulates, and two additional source emission test methods to be determined by the Office of Air, Noise and Radiation.

- Maintenance of a repository of standard reference materials for ambient air pollutants and for radioactive materials to evaluate performance of analytical laboratories and analysis.

- On-site audits of continuous analyzers for regulated pollutant emissions from stationary sources.

- Continuation of the Ambient Air Monitoring Reference and Equivalency Regulation program cited in 40 CFR 53.

- Performance audits for the inhalable particulate monitoring network and visibility studies.

- Statistical studies to provide basic tools for improving the analysis of air monitoring data.

TECHNICAL SUPPORT

1978 Accomplishments

The 1978 resources of $2,985,700 and 56 positions include approximately $76,000 in contracts, and $19,000 in grants. In 1978 the program:

- Provided analytical services to special monitoring networks such as the non-criteria pollutant monitoring network, National Fuels Surveillance Network (NFSN), and National Air Surveillance Network (NASN);

- Provided monitoring data to the Office of Air Quality Planning and Standards in support of implementation plans and control strategy developments, e.g., data for NO_2 levels in large urban areas, ozone levels in National Forests; and ethylene dichloride, perchloroethylene and benzene levels at suspected major sources of emissions;

- Provided monitoring data to Office of Enforcement on levels of phosphorous in gasoline and confirmatory analysis of lead in gasoline in support of compliance program.

- Provided monitoring data on levels of asbestos at a Maryland pollution site, and polynuclear organic matter at a Pennsylvania site for Region III, and for mercury at a New Jersey site for Region II.

- Operated the Collaborating Center for Environmental Pollution Control, a global, international cooperative effort with the World Health Organization.

- Operated the International Precipitation Laboratory as a joint effort for the World Meteorological Organizations.

- Provided 350,000 high quality glass fiber filters for use in the NASN and analyzed samples for non-criteria pollutants.

- Provided data to Region VIII and the State of Washington on sulfur oxide plume dispersion from the Anaconda Smelter. Data is to be used to develop a dispersion model which is expected to be useful in revision of the State Implementation Plan for sulfur oxides.

- Provided data to Region IX and State of Hawaii documentating levels of sulfur oxide near two power plants suspected to be in violation of existing sulfur oxide standards. Data is to be used for model development and for alternative control by Hawaii in developing revised State Implementation Plans for sulfur oxide.

- Provided vertical structure of oxidant levels and oxidant precurser levels in the Lake Tahoe Basin to Region IX and the States of Nevada and California. This data is to be used to develop control strategy and models useful in enforcing the State Implementation Plans.

- Performed a study of the impact on air quality of roadway emissions for catalyst equipped cars.

- Provided liaison with the Regional Offices.

1979 Program

The 1979 resources for Technical Support are $3,316,400 and 37 positions including $1,156,500 for contracts and $115,000 for Interagency Agreements. The 1979 program for Air Technical Support is designed to:

- Provide high quality glass-fiber filters for national use in SIP monitoring for particulates in ambient air. Develop specifications for filters and provide performance testing.

- Perform analyses on NASN filters returned by Regions for up to 56 metals, benzo(a) pyrene and non-metal inorganics.

- Analyze gasoline samples for lead, phosphorous and manganese for enforcement actions by Regions.

- Conduct field monitoring for the Office of Air Quality Planning and Standards in support of implementation plans and development of control strategy; monitoring for organic chemcials at suspected major sources of emissions.

- Conduct special studies to support regional air pollution investigations, e.g., arsenic, mercury, asbestos, benzo(a)pyrene and other suspected hazardous chemicals as required.

- Continue study of impact on air quality of roadway emissions from catalyst equipped cars with special emphasis on CO, NOx, and inhalable particulates;

- Continue to operate the Collaborating Center for Environmental Pollution Control, a global, international cooperative effort with the World Health Organization.

- Continue to operate the International Precipitation Laboratory as a joint effort for the World Meteorological Organization.

- Complete the Eastern Oxidant Transport Study (Philadelphia area) to extend the data base on long range transport in North-East area.

- Support liaison with Regional Offices.

1979 Explanation of Changes from Budget Estimates

The net decrease of -$244,600 results from Congress having applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$302,000. A net increase of +$57,400 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

1980 Plan

The 1980 resources required for Technical Support are $3,204,800 and 32 positions, a decrease of $111,600 and five positions from the fiscal year 1979 level. The decrease will reduce the number of requests for technical support that can be met. Approximately $1,087,200 will be used for extramural programs. Technical support is a level-of-effort program responding to needs of the Regions and regulatory offices and specific projects may vary as their needs vary. However, past experience indicates that the following types of projects will be accomplished:

- Continue to monitor ozone concentrations in selected National Forests to gather data for model development and validation and to develop and evaluate control strategies.

- Develop protocol and conduct a field study to collect data for use in models for intermedia range (50 miles) transport of oxidants and NOx.

- Conduct field studies and determine atmospheric loading of other pollutants being considered for regulations, such as benzene, benzene solubles, trichlorethylene, chloroform, and benzyl chloride.

- Conduct long-range oxidant transport study in support of Office of Air Quality Planning and Standards requirements.

- Evaluate characteristics of selected pilot National Air Monitoring Stations (NAMS).

- Assist in procurement, acceptance and distribution of 400,000 glass-fiber filters.

- Provide analyses of lead and phosphorous in gasoline for potential enforcement actions for regional enforcement offices.

- Provide special analytical services to Regions.

- Operate Collaborating Center for Air Pollution Control for the World Health Organization and operate the International Precipitation Laboratory for the World Meterological Organization; and

- Perform liaison with Regional Offices.

Abatement and Control

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
			(dollars in thousands)			
Appropriation						
Air Quality and Stationary Source Planning and Standards.....	$17,202	$24,325	$22,194	$37,475	+$15,281	A-40
Mobile Source Standards and Guidelines.....	7,845	14,070	14,554	11,160	-3,394	A-48
State Programs Resource Assistance.....	64,485	101,061	131,609	86,661	-44,948	A-55
Air Quality Strategies Implementation.....	6,408	6,210	8,901	8,710	-191	A-61
Mobile Source Preproduction Compliance Verification.	5,961	4,765	5,172	3,730	-1,442	A-65
Trends Monitoring and Progress Assessment.....	4,186	6,075	4,475	4,230	-245	A-70
Total.....	106,087	156,506	186,905	151,966	-34,939	
Permanent Positions						
Air Quality and Stationary Source Planning and Standards.....	244	238	253	252	-1	
Mobile Source Standards and Guidelines.....	138	130	132	162	+30	
State Programs Resource Assistance.....	8	6	6	6	...	
Air Quality Strategies Implementation.....	251	264	264	324	+60	
Mobile Source Preproduction Compliance Verification.	112	111	109	71	-38	
Trends Monitoring and Progress Assessment.....	128	143	128	128	...	
Total.....	881	892	892	943	+51	
Full-time Equivalency						
Air Quality and Stationary Source Planning and Standards.....	...	...	280	280	...	
Mobile Source Standards and Guidelines.....	...	...	165	201	+36	
State Programs Resource Assistance.....	...	...	50	72	+22	
Air Quality Strategies Implementation.....	...	...	357	357	...	
Mobile Source Preproduction Compliance Verification.	...	...	123	87	-36	
Trends Monitoring and Progress Assessment.....	...	...	144	139	-5	
Total.....	...	...	1,119	1,136	+17	

Purpose

The Abatement and Control appropriation encompasses air program activities related to the development and implementation of air pollution control strategies and control programs. These activities include technical and policy guidance, financial support for State and local programs, and direct Federal action when States fail to fulfill their responsibilities as required by the Clean Air Act. The Act envisions the development and implementation of most aspects of air pollution control as a State responsibility with guidance and assistance provided by EPA.

Abatement and control activities in the air program support the overall air program objectives of attaining and maintaining National Ambient Air Quality Standards. The highest priority objective for States and EPA in 1979 is the development and approval of revisions to the State Implementation Plans (SIP) for areas not presently attaining ambient air quality standards. The principal emphasis in 1980 will be the follow-up and implementation of the SIP schedules developed in 1979. Support of State and local programs in order to achieve this objective is of the highest priority under this appropriation. The implementation of complementary Federal controls such as New Source Performance Standards, motor vehicle emission controls, and Federal action where States fail to act, is also of high priority. A major initiative will be undertaken to complete SIPs in nonattainment areas not completed in 1979. Grant support to State and local planning and control agencies will provide funding for States to meet the commitments outlined in their 1979 SIP submittals. Particular attention will be given to Transportation Control Measures (TCMs) and inspection and maintenance programs.

The abatement and control activities are categorized under the following subactivities:

Air Quality and Stationary Source Planning and Standards. This subactivity is related to (1) the development of nationwide control strategies for both regulated and unregulated pollutants, the reassessment and modification of these strategies, and the translation of decisions on appropriate control requirements into regulatory actions, and (2) the development of emissions standards for stationary sources of air pollution, and the requisite supportive analyses and technology assessments. Control strategies developed under this subactivity are translated into guidance for State action -- State Implementation Plans -- or directly into Federal control requirements -- New Source Performance Standards or National Emission Standards for Hazardous Air Pollutants. Extensive activities are also carried out to provide the engineering and other technical support requisite for the development of regulations promulgated by EPA when States do not act.

Mobile Source Standards and Guidelines. This subactivity involves the setting of emissions standards for mobile sources (including the associated testing, technical analysis and technology assessments), and the development of mobile source related technical procedures and guidelines applicable to the control of emissions from new and in-use vehicles. Under this subactivity, findings made in relation to the need for control of mobile source emissions through the research and development activities or through the air quality and stationary source planning and standards subactivity are translated into practical control programs applicable to appropriate classes of motor vehicles or to appropriate stages of motor vehicle's life, from design to the end of their useful lives.

State Programs Resource Assistance. This subactivity involves the provision of resources to support State and local government's activities in implementing air pollution control programs. The primary responsibility for controlling air pollution rests with the States and localities. Supplemental resources are required if these governments are to effectively implement air pollution control programs, thereby eliminating or reducing the need for direct Federal intervention. Support is also provided for training of control agency personnel. Resource supplementation complements the purpose of the activities carried out under the other subactivities of the Abatement and Control appropriation.

Air Quality Strategies Implementation. This subactivity is related to the implementation of regulatory requirements for which the Federal Government has primary responsibility, such as (1) the consultation with, and overview of, air pollution control activities carried out by Federal facilities, (2) the review of environmental impact statements prepared by other Federal agencies for air pollution impact, and (3) the implementation of air quality standards and control strategies in specific areas of the Nation. These activities result in the implementation of the general control strategies, developed under the standards setting subactivities, at specific areas of the Nation -- States and localities -- through State and local control programs. Examples of these activities are the development of State Implementation Plans (SIP) and EPA promulgation of regulations, all technical aspects of the development of the control strategies incorporated into the SIP, and the management of the procedural requirements, such as public hearings on plans.

Mobile Source Preproduction Compliance Verification. This subactivity involves the engineering review of prototype motor vehicles and engines in order to determine whether or not they conform with motor vehicle emissions standards developed under the mobile source standards and guidelines subactivity. It also includes confirmatory testing and other laboratory or data analysis related to the certification process.

Trends Monitoring and Progress Assessment. This subactivity includes the determination of ambient air quality and emission levels, determining their relationships, and assessing progress made towards the attainment of environmental goals. These data and assessments are used for reassessing, changing, or developing control strategies, and for judging the progress made in achieving legislative or regulatory program goals.

The determination of emission levels is an activity fundamental to the administration of programs at the State, local, and Federal levels for developing regulations for the State Implementation Plans, reviewing new sources, and making determinations as to the siting of new sources.

Abatement and Control

Air Quality and Stationary Source Planning and Standards

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Emission Standards and Technology Assessment.....	$ 9,517	$18,375	$15,132	$29,975	+$14,843
Energy and Pollutant Strategies Development....	2,505	2,575	2,594	3,150	+ 556
State Program Guidelines and Regulations Development.....	5,180	3,375	4,468	4,350	- 118
Total.....	17,202	24,325	22,194	37,475	+ 15,281
Permanent Positions					
Emission Standards and Technology Assessment.....	114	121	121	121	...
Energy and Pollutant Strategies Development....	36	44	41	41	...
State Programs Guidelines and Regulations Development.....	94	73	91	90	-1
Total.....	244	238	253	252	-1
Full-time Equivalency					
Emission Standards and Technology Assessment.....	...	...	131	131	...
Energy and Pollutant Strategies Development....	...	...	49	49	...
State Programs Guidelines and Regulations Development.....	...	...	100	100	...
Total.....	...	...	280	280	...

Budget Request

The resources requested for this budget subactivity are $37,475,300 and 252 positions. This reflects an increase of $14,843,000 over the 1979 level for the development of emission standards for new stationary sources as mandated by the Clean Air Act Amendments of 1977.

Program Description

This subactivity includes the setting of emission standards for stationary sources and all industry studies, cost studies, and other analyses which support the standard setting function. Also included is the setting of ambient air quality standards, the development and reassessment of nationwide control strategies needed to meet these standards, studies oriented toward the balancing of energy and environmental goals, the assessment of potential pollutants, the development of pollutant control strategies, analytical tools and guidelines, and the translation of all such control strategies into regulatory actions.

Emissions Standards and Technology Assessments -- National emission standards for stationary sources are set under Sections 111 and 112 of the Clean Air Act. Section 111 mandates the Environmental Protection Agency to establish standards of performance for new stationary sources. Section 112 mandates national emission standards for hazardous air pollutants.

New Source Performance Standards (NSPS) are set to reflect the performance of the best systems of emission reduction, considering cost, for specific processes or facilities in a source category. The analysis leading to and supporting the NSPS consider technical feasibility, cost, and economic, energy, and environmental impacts. The importance of NSPS has been emphasized by the 1977 Amendments to the Clean Air Act. Section 111(f) requires that EPA publish a list of major stationary sources of air pollution for which NSPS have not yet been proposed or promulgated. Presently, a total of 28 source categories are regulated by NSPS, with NSPS for an additional 25 source categories under development. NSPS for all listed source categories must be set by 1982. It is expected that approximately 80 source categories will have to be covered by NSPS. The NSPS are also tied to the implementation of control strategies for nonattainment air quality control regions and for the prevention of signficant deterioration, according to the 1977 Clean Air Act Amendments. The NSPS setting process results in providing useful data to State agencies in defining best available control technology, lowest achievable emission rates, and reasonably available control technology. In addition, the New Source Performance Standards provide a legally binding upper limit to the deterioration of ambient air quality.

The setting of National Emission Standards for Hazardous Air Pollutants (NESHAP) has emerged as a priority item in EPA to protect public health from carcinogens and mutagens. Asbestos, beryllium, mercury, vinyl chloride,and benzene have been listed as hazardous air pollutants. NESHAP have been established for significant emitters of these pollutants, except for benzene. The program to establish NESHAP for benzene is currently underway.

Energy and Pollutant Strategies Development -- The Clean Air Act requires that studies be made of the air pollution effects of the pollutants cadmium and polycyclic organic matter (POM), and that EPA decide upon a control approach -- setting NAAQS, listing as hazardous air pollutants, or setting New Source Performance Standards (NSPS). In addition, the Act requires that a determination be made in relation to short-term exposure to nitrogen dioxide, and that all criteria and National Ambient Air Quality Standards (NAAQS) already issued be reviewed by the end of 1980. Work on these activities is progressing.

An assessment of the need for controlling specific chemicals is carried out by the Agency. The regulatory alternatives for controlling these pollutants may be any of a series of authorities provided by the Clean Air Act -- Section 111 (NSPS) or Section 112, National Emission Standards for Hazardous Air Pollutants (NESHAP). Preliminary risk assessments for 50 chemicals, presumed to be prevalent in the environment, are being conducted.

EPA participation in energy development and supply related programs require access to timely and accessible data on fuel use and air quality. EPA has developed and utilizes an energy/environment data system.

State Programs Guidelines and Regulations Development -- National Ambient Air Quality Standards (NAAQS) have been set for seven pollutants. Although most reasonably available control methods have been employed nationally, many regions have not attained standards. The Clean Air Act Amendments of 1977 address the problems of nonattainment of the standards, providing for extended time frames for attainment. These extended time frames are coupled with stringent requirements that must be met by the State Implementation Plans and sources of air pollution in areas exceeding the standards. This situation also requires a reassessment of control strategies, the development and application of methodologies and criteria for control strategy development for large geographic areas and for specific areas, and the implementation of these controls.

In addition, air pollution problems related to atmospheric transformations -- nitrogen dioxide and nitrates formed from nitrogen oxide emissions, photochemical oxidants from hydrocarbons and nitrogen oxides, and sulfates from sulfur dioxide -- affect large scale geographic areas, multistate areas, far exceeding the size of Air Quality Control Regions (AQCRs). New approaches to air pollution control for areas of this magnitude are required. In other cases, for sulfur dioxide or carbon monoxide related air quality problems, refinements and improvements in well understood techniques may be in order for optimal effectiveness of control requirements.

The Clean Air Act requirement for the revision of the State Implementation Plans and the expected additional plan revisions for the maintenance of the standards require that new control strategies be adopted by the States and localities. The identification of these control strategies and the development of the control plans require the development and dissemination of policy, procedures, and guidelines which can be utilized by States in implementing plan revision and development actions. For example, EPA prepares guidelines for control of noncriteria pollutants emitted from sources covered by New Source Performance Standards for which regulations are required under Section 111(d) of the Clean Air Act. Other examples include special studies to identify and eliminate technical barriers to the achievement of the standards -- fugitive emission/urban particulate background. In addition, analytical tools are prepared for State and local agencies to aid in control strategy reassessment and development; EPA activities supportive of States in these tasks are described under the air quality strategies implementation subactivity.

EMISSION STANDARDS AND TECHNOLOGY ASSESSMENT

1978 Accomplishments

1978 resources included approximately $6.7 million in contract support. These funds were used for engineering studies and other analyses needed to support New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAP), and revisions to State Implementation Plans. This included continued detailed studies of the synthetic organic chemical manufacturing industry and studies of industrial surface coating evaporation losses, as well as emission measurements, cost analyses, environmental and energy impact assessment, and engineering studies of other specific industries. Programs also support revision of control techniques documents for particulate matter and for sulfur oxides.

New Source Performance Standards for petroleum storage tanks, and fossil fuel-fired steam generator plants were proposed. Regulations for sewage sludge incinerators, kraft pulp mills, lignite fired steam generators, sulfur recovery plants in petroleum refineries, grain elevators, lime plants, and an opacity standard for basic oxygen furnaces were promulgated. As required by the Clean Air Act, a list of major source categories (to be regulated by NSPS) was developed and proposed in the Federal Register. In accordance with the statutorily specified time-table, NSPS must be promulgated for 25 percent of the source categories listed by August 1980, for 75 percent by August 1981, and for all of the categories by 1982. A guidance document concerning the lowest achievable emission rate was issued for comment. Guidelines defining reasonably available control technology were issued for 15 source categories. Also, studies to determine if existing NSPS need to be reviewed were initiated for 10 source categories. The asbestos NESHAP was revised to control the use of asbestos containing decorative sprays. Regulations to control hazardous emissions from coke ovens were proposed. Engineering guidelines to implement Section 111(d) were finalized for sulfuric acid plants and proposed for kraft pulp mills.

1979 Program

The development of emission standards and technology assessment has been allocated $15,132,000, and 121 positions. These resources include approximately $12.0 million in contract funds. These contract resources are to be used to continue the work related to setting standards for the synthetic organic chemical manufacturing industry and the studies required for the setting of other NSPS, NESHAP, and the issuance of reasonably available control technology guidelines for review of State Implementation Plans (SIP).

Work is continuing to meet the 1982 deadline for NSPS for all listed source categories. NSPS are promulgated for fossil fuel steam generators (revision), petroleum liquid storage vessels, and gas turbines. NSPS are proposed for glass manufacturing, internal combustion engines, sulfur recovery in natural gass fields, nonmetallic minerals, organic solvent metal cleaning, surface coating operations for auto assembly plants, lead battery manufacturing, phosphate rock, and aluminum plant fluoride control for existing plants. Development work is being conducted on 33 additional NSPS. Screening studies are being performed on up to 10 potentially major organic solvent source categoried not contained on the promulgated list. Review of six and revision of two existing NSPS are being undertaken. Control technique decuments (CTD's) are being developed for SOx and particulates. Control technique guidelines (CTG's) are being developed for two petroluem categories, three solvent use categories, 100 organic chemical process sources, and for synthetic organic chemical manufacturing fugitive losses, secondary sources, and storage and handling.

NESHAP are proposed for asbestos-iron ore benefication and maleic anhydride. Development work is proceeding on 11 additional NESHAP.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$3,243,300 results from several actions, An increase of +$329,400 resulting from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise is offset by the reprogramming of -$1,000,000 to other Agency activities to support the cost of the most recent pay increase. In addition, a pay back of -$3,000,000, "borrowed" in 1978, to water quality areawide waste treatment management/Section 208 is offset by the reprogramming of +$427,300 from energy and pollutant strategies development ($94,900), ambient air quality monitoring ($292,100) and air quality and emission data assessment ($40,300) within this media as part of the Agency's ZBB review of resource requirements for the 1979 operating plan.

1980 Plan

The 1980 plan includes $29,975,300 and 121 positions, including approximately $26.8 million in contract funds. This represents an increase of contract funds of $15 million, which will provide for setting emission standards for all significant stationary source categories before the 1982 deadline established by the Clean Air Act Amendments of 1977. This effort will encompass between 70 and 80 source categories.

New Source Performance Standards will be proposed for can coating, pressure sentitive tapes and labels, metal furniture and large appliances coating operations, synthetic organic chemical storage, handling and transfer operations and fugitive emission sources, rubber industry, graphic arts, vegetable oil, ammonium sulfate fertilizer, ammonium nitrate fertilizer, perchloroethylene dry cleaning plants, and urea production. Studies on surface coating operations were initiated in 1976 and 1977. NSPS for organic solvent metal cleaning, surface coating operations for auto assembly plants, lead battery manufacturing, aluminum fluoride control for existing plants, phosphate rock, glass manufacturing, internal combustion engines, sulphur recovery in natural gas fields, and nonmetallic minerals, will be promulgated.

National Emission Standards for Hazardous Air Pollutants (NESHAP) will be proposed for four coke oven sources, asbestos released for crushed stone and up to seven benzene sources. NESHAP will be promulgated for asbestos from iron ore beneficiation. Work on the development of NESHAP will continue, with emphasis on sources of asbestos, cadmium, polycyclic organic matter (POM) and other selected organic substances.

Standards support and environmental impact statement (SS/EIS) work for all remaining sources on the NSPS priority list will begin. These efforts in standards development projects will enable EPA to promulgate NSPS for all categories of major sources by 1982.

ENERGY AND POLLUTANT STRATEGIES DEVELOPEMENT

1978 Accomplishments

1978 resources included approximately $1.2 million for contract support for pollutant screening and control strategy evaluations, and economic analyses of control strategies and control plans.

Preliminary screening of some 700 organic chemicals as potential air contaminants was completed. Those chemicals determined to be of special concern are being further assessed to establish the need for regulatory action.

A National Ambient Air Quality Standard (NAAQS) for lead was promulgated. A review and proposal of a revised NAAQS for photochemical oxidants was completed. A review of the current NAAQS for nitrogen dioxide and carbon monoxide was initiated. Determinations as to the need for control of arsenic, POM, and cadmium and the need for a NAAQS for short-term exposures of nitrogen dioxide were initiated.

1979 Program

The work on energy and pollutant strategies has been allocated $2,594,300 and 41 positions. These resources include an estimated $1.25 million in contract funds. A major focus is assessment of the need to revise the NAAQS for particulates and SO_2. Related issues such as the possible establishment of an inhalable particulate standard are addressed in the review of these pollutants. In addition, a short-term NO_2 air quality standard may be proposed. Recommendations are made as to the need to revise the annual NO_2 air quality standard, and the CO air quality standard. A second major emphasis is the continuation of the work on the toxic or hazardous air pollutants that were identified as high priority for further evaluation. Specifically, the program provides for analytic assessments of arsenic, coke ovens, POM, cadmium, acrylonitrile, ethylene dichloride, perchlorethylene and vinylidene chloride as potential hazardous air pollutants under Section 112, and the completion of a preliminary classification of approximately 50 chemicals. A policy for regulating airborne carcinogens is being developed.

In the energy area, studies, policy recommendations, and programmatic actions pertinent to the relationship between fossil fuel combustion and air quality requirements are carried out. Such actions include support for promulgation of visibility regulations; maintenance of the energy and environmental data base for analysis of the impact of regulations on utility boilers and other fuel burning sources; analyses (economic, energy, and environmental) of the impact of coal sulfur variability (CSV) on compliance with current NSPS for utility boilers (includes defining key economic and technical issues, and developing alternatives for effecting compliance); maintenance of data on utility expansion plans and analyses with respect to impact on PSD increments, ability to meet NSPS, increase in SO_2 emissions, and the impact of EPA policies on utility growth; and analyses of the environmental impact of business and consumer practices which negatively impact control programs (e.g., fuel switching, mal-maintenance, various gasoline additives programs, and control device performance variability).

1979 Explanation of Changes from Budget Estimate

The net increase of +$19,300 results from two actions. A net increase of +$114,200 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan, -$94,900 was reprogrammed to emission standards and technology assessment.

1980 Plan

The 1980 plan includes $3,150,000 and 41 positions. Contract funds amount to approximately $1.2 million. A revised NAAQS for particulates and SO_2 will be promulgated, as warranted by the 1979 assessment of the need for revision in light of the latest evidence. Promulgation of these standards include criteria documents development and analysis of attainment strategies; analyses of energy, environmental and economic impacts for alternative standards; development of the preamble and regulation documents; insuring adequate public participation through meetings and hearings; responding to all public comments; and developing the documents for promulgation.

Suspected carcinogenic substances will be defined and regulatory programs initiated. Preliminary risk assessments of 50 chemicals will be completed enabling the Agency to augment a priority list of chemicals for air regulatory decision making on the basis of their threat to public health. Health input data will be prepared to permit a decision as possible NESHAP for acrylonitrile, ethylene dichloride, perchloroethylene and vinylidene chloride. Trichloroethylene and methylchloroform will be listed as hazardous pollutants.

In the energy area, studies, policy recommendations, and programmatic actions pertinent to the relationship between fossil fuel combustion and air quality requirements will be carried out. The major focus will be on the trend toward increased coal use and decreased oil and gas use. EPA will provide a coordinated, widely distributed set of written policies and guidelines to solve coal sulphur variability (CSV) problems relative to emissions regulations, continuous monitoring requirements and new source review decisions. This will include revised regulations, enforcement guidelines and technical as necessary to solve the CSV problems relative to SIP SO_2 emission limits and the consideration of CSV in the new source review under PSD and NAAQS requirements.

STATE PROGRAMS GUIDELINES AND REGULATIONS DEVELOPMENT

1978 Accomplishments

1978 resources included approximately $1.13 million in contract support for studies on issues and problems related to the air pollution control program and for the guidance materials.

The 1978 accomplishments are related to completing mandatory requirements resulting from the 1977 Amendments. Policy and program guidance concerning the content of SIP revisions was prepared for all nonattainment areas. Technical guidance on control strategies for these SIP revisions was also prepared, including major guidance on air quality modeling. Interim procedures for modeling oxidants were developed. Regulations setting out the prevention of significant deterioration program were promulgated. A program to help ensure national consistency in BACT/LAER determiniations was initiated. Regulations concerning lead SIP requirements were prepared.

1979 Program

The development of State programs guidelines and regulations has been allocated $4.4 million and 91 positions. These resources include approximately $2.2 million in contract funds. The program emphasizes the resolution of technical problems of attaining the ozone (O_3) standard and the provision of direction and national consistency to New Source Review (NSR). The complexity of $HC/HO_x/O_3$ relationship creates major problems in designing control strategies for the attainment of O_3 standard and servously impacts the States' ability to develop O_3 State Implementation Plans (SIP). The NSR program, which directly affects private sector growth, is also emphasized through the continuation of a program to ensure consistency of BACT/LAER determinations.

Specifically, regulations and program guidance are being developed to guide States on new or revised O_3, CO, and NO_x standards. Technical guidance, concerning air quality models, emission factors, design of field studies, and other SIP control strategy related problems, is also being developed to support the new and revised ambient standards. As noted above, particular emphasis is being given to removing the technical barriers in attaining the O_3 standard. This is part of a multiyear program which is leading to 1982 O_3 SIP revisions. In addition, regulations and supporting program and technical guidance to implement congressional requirements concerning PSD for CO, NO, and O_3, and visibility protection are in the initial stages of development. Guidance related to PSD for TSP and SO_2 is also being completed. A limited program to evaluate the 1979 nonattainment SIPs for national consistency is being conducted.

The 1979 program is also integrating transportation control activities between EPA and the Department of Transportation. Guidelines are developed to reduce potentially duplicative and inconsistent activities at the State and local levels. Additional guidance is being prepared for States to use in developing a public transportation plan for non-attainment areas demonstrating the need for a standard attainment deadline extension to 1987. This SIP revision must establish, expand, or improve public transportation to meet basic transportation needs as expeditiously as practicable. Transportation control measures TCM's) and strategies are to be identified and analyzed for their economic, energy, environmental, and urban planning impacts.

1979 Explanation of Changes from Budget Estimates

The net increase of +$1,093,000 results from several actions. A net increase of +$247,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan, +$845,200 was reprogrammed to this activity from air quality and emission data assessment reflecting the increased emphasis on policy and guidance development relating to State Implementation Plan (SIP) revisions.

1980 Plan

The 1980 plan includes $4,350,000 and 90 positions. Contract funds amount to approximately $2.8 million.

The 1980 program will build on the emphasized activities of 1979 (specifically O_3 and NSR) and will also include a limited initiative to support a revised particulate standard. Specifically the program of O_3 diffusion model development and testing will be intensified, with a particular emphasis on the NO_x/O_3 relationship and modeling of microscale impacts. The national program to ensure consistency of NSR will be continued. Technical guidance materials on modeling and emission factors will be developed. The regulations and program and technical guidelines required for Inhalable Particulate (IP) SIPs will be initiated and proposed. This will require extensive work in the area of models and emission factors. A limited program to ensure national consistency in the annual review/approval of nonattainment SIPs will be undertaken.

State Implementation Plan revision activities will be assessed to assure consistent applications of national policy and to identify potential conflicts between plan revisions and national urban policy. Policies on Clean Air Act sanctions affecting federally sponsored activities, including those of EPA, will be developed, and the application of the sanctions will be monitored to assure nationwide consistency. Regional office, State, and local activities related to the transportation components will be evaluated to determine progress toward compliance with Clean Air Act requirements, to assure that national policies and guidance are being applied consistently and to identify the need for new or revised national policies and guidance.

Abatement and Control

Mobile Source Standards and Guidelines

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Mobile Source Standards and Guidelines.....	$ 4,567	$10,811	$ 9,270	$ 5,815	-$3,455
Mobile Source In-Use Emission Assessment.....	1,337	1,484	3,176	3,020	-156
Emissions Testing, Analysis and Data Support for Standards and Guidelines.....	1,941	1,775	2,108	2,325	+217
Total.....	7,845	14,070	14,554	11,160	-3,394
Permanent Positions					
Mobile Source Standards and Guidelines.....	67	63	65	110	+45
Mobile Source In-Use Emission Assessment.....	9	8	8	6	-2
Emissions Testing, Analysis and Data Support for Standards and Guidelines.....	62	59	59	46	-13
Total.....	138	130	132	162	+30
Full-time Equivalency					
Mobile Source Standards and Guidelines.....	...	...	89	137	+48
Mobile Source In-Use Emission Assessment.....	...	...	18	19	1
Emission Testing, Analysis and Data Support for Standards and Guidelines.....	...	...	56	45	-11
Total.....	...	...	165	201	+36

Budget Request

The resources requested for this budget subactivity are 162 positions and $11,160,000. This reflects a reduction of $3,394,000 due to the anticipated completion of many one-time tasks mandated by the Clean Air Act Amendments of 1977. The increase of 30 positions reflects increased emphasis on the development of heavy-duty vehicle and hazardous pollutant standards and in-use vehicle control.

Program Description

This subactivity involves the development of emission standards for mobile sources of air pollution -- passenger motor vehicles, heavy duty and light duty trucks, motorcycles, and aircraft -- and associated technical activities, such as testing, technology assessments, and emissions characterization. It also involves the development of technical procedures and guidelines applicable to the control of emissions from new and in-use vehicles. The Clean Air Act Amendments of 1977 set forth an extensive control program for mobile sources.

The development of standards for mobile sources begins with a characterization and analysis process. After developing appropriate emissions sampling and testing procedures, EPA personnel determine and characterize air pollution emissions representative of individual vehicles. An essential part of this process is the continuous assessment of new or improved technologies for potential changes in the nature and magnitude of air pollutant emissions and other related performance factors, such as fuel economy. On the basis of this characterization assessment work, EPA then proceeds to set appropriate standards for various mobile sources, taking into account what is known about air quality and the health effects of emissions.

After the promulgation of standards, it is necessary to devise the tests, monitoring mechanisms, or other strategies required to ensure compliance with them. This subactivity includes the technical work underlying EPA's efforts to assure the compliance of both new vehicles (e.g., certification) and in-use vehicles (e.g., inspection and maintenance).

Allied with this effort are activities aimed at determining mobile source in-use emissions performance. The findings are used to calculate the average emissions that are to be expected from the in-use vehicle population, and to assess the effectiveness of mobile source emission control programs. Samples tested are generally selected by model year, and are representative of diverse geographic areas. The data so obtained are used to calculate emission reductions required for attainment and maintenance of National Ambient Air Quality Standards (NAAQS). Since this testing began in 1973, the results have consistently indicated that between one-half and three-quarters of tested in-use vehicles failed to meet standards. Much of this failure appears to be attributable to basic maladjustments or disablements of vehicle engines or emission control systems. These conclusions point to the need for augmented compliance measures for in-use vehicles.

Emission controls for the various categories of mobile sources are at different stages of development. In addition to control actions for automobiles undertaken in the past, the Clean Air Act Amendments of 1977 mandate the setting of standards for additional sources and require technology assessments and analyses of economic and energy impacts. The controls for trucks and motorcycles are not now at the levels of stringency of passenger cars. As emission standards are imposed on additional classes of motor vehicles and the stringency of these standards increases, reassessments of the control technology used by the manufacturers, in terms of energy and nonregulated pollutant impacts, are required. Therefore it is expected that work of increasing complexity, involving additional classes of motor vehicles, will be carried out for the foreseeable future. For example, emissions of currently unregulated pollutants for diesel-powered and catalyst controlled vehicles are being assessed to determine if additional regulatory action to prevent the emission of potentially carcinogenic and toxic substances is needed.

Specific requirements of the Clean Air Act Amendments of 1977 include:

- The evaporative emissions of heavy-duty vehicles and engines (beginning with the 1979 model year) must be measured. The Act also requires investigation of the feasibility and desirability of requiring vehicles to employ on-board control of hydrocarbon emissions resulting from vehicle fueling, and the promulgation of regulations if it is determined that such a program is more desirable than a program employing vapor recovery systems at service stations. If EPA promulgates regulations requiring stage II vapor recovery systems, it must then promulgate motor vehicle fill pipe design standards.

- Regulations requiring a 90 percent reduction in hydrocarbon (HC) and carbon monoxide (CO) emissions for 1983 model year heavy-duty vehicles (including light-duty trucks) and requiring a 75 percent reduction in nitrogen oxide (NOx) emissions for 1985 model year heavy-duty vehicles are required by December 1979. The baseline years from which these reductions are to be calculated are 1969 for HC and CO and 1973 for NOx.

- Motor vehicle inspection and maintenance (I/M) programs for in-use vehicles will be required in many parts of the country beginning in the early 1980's. Before these programs become operational, a great deal of technical work must be completed to ensure the availability of adequate test equipment and procedures, accurate information about anticipated results, and a requisite level of expertise among local officials, mechanics, and other involved parties.

- Particulate emissions standards for classes or categories of vehicles are required beginning with the 1981 model year. Pollutant specific studies on heavy-duty and other categories of mobile sources are required at 3-year intervals. A study and report to Congress on particle emissions rates, size, and composition as well as potential health and welfare effects for all categories of mobile sources is required.

- All vehicles are required to meet the Section 202 emission standards, regardless of the altitude at which they are sold, beginning with the 1984 model year.

- An annual report to Congress on fuel consumption effects associated with emissions standards compliance of vehicles of the immediately preceding model year is required. Also required is a study of air pollution emissions from railroads to determine the air quality effect of those emissions, the feasibility of controlling them, and the status and effect of State and local railroad emission control regulations.

- The Administrator is to enter into appropriate arrangements with the National Academy of Sciences to conduct continuing comprehensive studies and investigation of the technological feasibility of meeting emission standards.

In addition, this program must take steps to implement certain provisions of the recently enacted National Energy Conservation Policy Act. These requirements include possible revisions of fuel economy testing procedures and the need for information about additional classes of vehicles. Also required is a report (in collaboration with the Departments of Transportation and Energy) on how realistic current fuel economy estimates are.

MOBILE SOURCE STANDARDS AND GUIDELINES

1978 Accomplishments

1978 resources included $2.4 million for contracts. These contracts involved work in such areas as heavy duty standards, diesel emission control, test procedure improvement, analysis of an ongoing I/M program, aircraft emission standards, and assessment of emission standards impacts.

Major activities included: assessment of manufacturer efforts toward meeting statutory standards; initiation of studies leading to standard setting for heavy-duty engines, light-duty trucks, and particulate emissions for diesels; and preparation of the technical, informational, and procedural foundations for the institution of vehicle inspection and maintenance programs.

Also undertaken were various efforts to come to grips with technological changes in the automotive industry. Diesel technology has increasingly appealed to parts of the industry because of its potential for widespread use in all types of engines and because of its significant fuel economy advantage as compared to gasoline engines. For

this reason EPA initiated a program to characterize diesel emissions and assess their health effects for the public.

The electronic revolution in the auto industry, developed for meeting the more stringent emissions and fuel economy standards in the future, required the initiation of a program to assess the emissions impacts of these control devices under a variety of conditions. With this technology, the potential for unforeseen emissions of both regulated and unregulated pollutants under conditions (such as temperature or speed) other than those reflected in the Federal Test Procedure (FTP) is great. An evaluation of possible revisions to the FTP was begun.

1979 Program

The 1979 resources include $9.2 million and 65 positions. These resources provide for the proposal of standards reflecting a 90 percent reduction from baseline levels of hydrocarbons and carbon monoxide for heavy-duty engines. Standards will also be proposed for light-duty trucks, 1981-83 high altitude vehicles, heavy-duty evaporative emissions, and light duty diesel particulates. Final rulemaking is set for parameter adjustment regulations (aimed at limiting the adjustability of engine components such as choke and idle settings), as well as for a regulation promulgating short emission test procedures for inspection and maintenance programs (required for the implementation of emission warranties in accordance with Section 207(b) of the Clean Air Act).

A number of studies and technical analyses (some of them in conjunction with the Office of Research and Development) are being completed in 1979 in order to determine the need for future control actions. Potentially harmful levels of unregulated pollutants emitted from diesel powered engines and catalyst controlled vehicles are being quantified. Assessments are being made of the impact on emissions control of special fuels or fuel additives (e.g., gasohol) to determine the advisability of using such additives. Reports to Congress on control technology for light-duty vehicles and on the technological capability of manufacturers for meeting a 0.4 gram per mile standard for nitrogen oxide are being prepared. Assessments will be made of ways in which in-use failures of emission control systems can be made to trigger signals alerting the driver to the need for repair and of ways in which emission control systems can be made to perform effectively throughout the vehicle's useful life. The technological feasibility of high altitude emissions control is being determined.

Support will be provided to regions and States for widespread national implementation of inspection and maintenance programs. A nationwide series of seminars on I/M implementation will be completed, with technical followup as requested. In-depth reports on various I/M options for consideration by the States (including centralized versus decentralized inspection, and State operated versus contracted programs) are being prepared. Legislative information packages summarizing the benefits of inspection and maintenance and desirable features of legislation, a report on the fuel economy impacts of I/M, and analyses of results from the Portland, Oregon, I/M study (assessing the impact of an operational program) are being completed. Final rulemaking promulgating short-test procedures will allow for the establishment of emission warranties directly related to I/M programs. It will also be necessary to assess and follow through on the I/M related parts of the State Implementation Plan (SIP) revisions submitted in early 1979.

Contracts of $6.9 million support such efforts as heavy-duty standard setting, dynamometer emissions assessments, the quantification of emissions of unregulated pollutants, I/M evaluations, and an assessment of the three-way catalyst. Emissions are being characterized for light duty diesels and vehicles using gasohol to determine the need for control. Contract resources also support test procedure improvements and continuation of the National Academy of Sciences studies.

1979 Explantion of Changes from Budget Estimate

A net decrease of -$1,541,300 results from several actions. A net increase of +$227,400 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan, -$1,768,700 was reprogrammed within this activity to mobile sources in-use emission assessment ($1,684,500) and emission testing, analysis, and data support ($84,200).

1980 Plan

The 1980 level of $5.8 million, and 110 positions will increase the emphasis on the development of heavy-duty vehicle and hazardous pollutant standards and in-use vehicle control. This includes approximately $1.8 million for contracts.

Five categories of activity will receive emphasis in 1980. Emissions standards for heavy duty vehicles will be one critical focus. The standard development work initiated in 1977 to meet the 90 percent reduction requirements for hydrocarbons and carbon monoxide and the 75 percent reduction requirement for nitrogen oxide is expected to be completed in 1980, as is the rulemaking for an evaporative emission standard for the 1983 model year. A particulates standard for 1983 model year diesel engines will be promulgated in early 1981.

Work in the area of emission standards for light-duty vehicles will be related to gaseous exhaust emission standards for light-duty trucks, evaporative emission standards, high altitude emission standards and refueling emissions control. Resources will be required for technical studies related to standard setting as well as regulatory process management.

In 1980, aircraft emissions standards will be finalized. Work will concentrate on the completion of ongoing rulemakings and on the development of a standard for NOx emissions.

Hazardous pollutant control is another target of major attention in 1980. During 1978 and 1979, guidelines and regulations were developed to ensure manufacturer compliance with the Section 202(a)(4) of the Clean Air Act requirement that no emission control device can be used if it will cause or contribute to an unreasonable risk to public health. In 1980 additional regulatory development work will be necessary, given the significant health effects questions that are likely to remain unresolved (e.g., carcinogenicity of the organics emitted). Follow-up work will also be needed on determinations of emissions under non-FTP conditions. In the area of diesel emissions, available health and characterization data, will be assessed and preliminary determinations made of the health implications of widespread use of diesel engines in passenger cars.

During 1980, the States requiring an inspection and maintenance program must follow the implementation schedule included in the State Implementation Plan. This will require an EPA update of technical documentation developed in 1979, and the provision of area-specific technical information. Assistance to States in program implementation will include inspection standards and calibration, quality assurance procedures, and technical review of facilities and testing support equipment. Analytical evaluations of program effectiveness and new technologies will be conducted. Short tests for NOx control and improvements in current test procedures will be evaluated. The Portland I/M study will be extended for a year to allow for the accumulation of data on the emissions impact over a longer time period. In addition, I/M programs for heavy-duty vehicles will be initiated, because of the large potential for emission reductions from these sources.

1978 Accomplishments

1978 resources included $1.2 million for contracts. The bulk of these resources was dedicated to funding and managing contract testing of in-use vehicle populations to determine and analyze their actual emission levels. The data generated are critical to the accurate calculation of emissions reductions to be achieved by the State Implementation Plans for ozone, nitrogen oxide, and carbon monoxide, and to a lesser extent lead and particulates. The data and procedures developed and contained in AP42, (the official emissions factors source book) are mandated for use by all planning agencies in assessing air pollution impacts of motor vehicles. Updated emission factors for 1970 through 1977 model years light-duty vehicles were made available.

1979 Program

The monitoring of emissions from motor vehicles in actual use has been allocated $3.2 million and 8 positions. These resources include $3.0 million in contracts for the testing of in-use vehicle populations in order to update emission factors for vehicles currently in-use. The development, improvement, dissemination, and use of emission factors for all classes of motor vehicles is essential to the implementation of the Clean Air Act mandated air quality planning process, especially as it relates to the 1982 SIPs for oxidants and carbon monoxide.

Work is being initiated in 1979 on determining actual emissions from in-use light-duty trucks. A contractor will perform chassis dynamometer based emissions tests. This testing will begin once the equipment has been procured and installed at the contractor's site. Analytical projects related to development of emission factors for AP42 and supportive analytical tools are being provided. An emissions factors program for motorcycles will be completed during 1979.

1979 Explantion of Changes from Budget Estimate

The net increase of +$1,692,300 results from several actions. A net increase of $7,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan, +$1,684,500 was reprogrammed within this activity from mobile sources standards and guidelines to enhance testing for the determination of in-use mobile source emissions.

1980 Plan

In 1980, $3.0 million and 6 positions will be allocated to this program. These resources will be used to continue work initiated in 1979 in testing in-use vehicles, determining their emissions under various conditions, and providing appropriate analyses for use in assessing program effectiveness and the need for both State-based control programs and the national program. Work will continue with determining emissions from light-duty and heavy-duty trucks. In-use emissions testing will continue through 1980 and beyond as an aid to heavy-duty standard setting and as a mechanism for reevaluating already established standards.

1978 Accomplishments

No contract resources were used in 1978. Activities included track testing of cars to determine effects of dynamometer power absorption characteristics on fuel economy; testing aimed at determining tire and dynamometer roll effects on emissions and fuel economy measurements; data analysis support for reports on changes in sulfate emissions with vehicle age; testing to develop procedures for measuring particulate emissions; assessment of the applicability of the Sealed Housing for Evaporative Determination (SHED) procedure (used in the measurement of evaporative hydrocarbon emissions from engines or vehicles); complete installation and review of a transient driving cycle dynamometer for use in measuring emissions from heavy duty engines; and data analysis support for the assessment of technology for meeting light duty vehicle emission standards.

1979 Program

The 1979 level of resources is $2.1 million and 59 positions. These resources include $330,000 in contract funds for data processing and testing support. Activities involve baseline testing in connection with standard setting for heavy-duty engines; support for the characterization of emissions from diesel vehicles; test procedure improvements in the areas of durability evaluation and road load determination; and analysis of data gathered in I/M assessment and emission factors programs.

1979 Explanation of Changes from Budget Estimate

The net increase of +$332,800 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$20,200. A net increase of +$62,200 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan, +$84,200 was reprogrammed within this activity from mobile source standards and guidelines and $206,600 was reprogrammed to this activity from ambient air quality monitoring to provide additional resources for implementing the mandates of the 1977 Clean Air Act Amendments, particularly in the area of heavy-duty vehicle standard setting.

1980 Plan

The 1980 level of resources for testing and data analysis in support of this subactivity is $2.3 million and 46 positions. Approximately $480,000 is provided for contracts. Planned activities include baseline testing for a NO_x standard for heavy-duty engines; support for test procedure improvements aimed at assuring the validity of the FTP; and efforts to characterize emissions of new technology vehicle

Abatement and Control

State Programs Resource Assistance

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Control Agency Resource Supplementation.....	$ 61,952	$ 75,000	$ 80,000	$ 85,600	+5,600
Training.....	2,533	1,061	1,609	1,061	-548
Grants for Planning for Control of Carbon Monoxide and Photochemical Oxidants in Nonattainment Areas.....	...	25,000	50,000	...	-50,000
Total.....	64,485	101,061	131,609	86,661	-44,948
Permanent Positions					
Control Agency Resource Supplementation.....	...	...	....	...	...
Training.....	8	6	6	6	...
Grants for Planning for Control of Carbon Monoxide and Photochemical Oxidants in Nonattainment Areas.....	...	...	...	...	...
Total.....	8	6	6	6	...
Full-time Equivalency					
Control Agency Resource Supplementation.....	...	...	43	65	+22
Training.....	...	...	7	7	...
Grants for Planning for Control of Carbon Monoxide and Photochemical Oxidants in Nonattainment Areas.....	...	...	...	...	...
Total.....	...	...	50	72	+22

Budget Request

The resources requested for this subactivity are $86,661,000 and six positions. This reflects an increase of $5,600,000 over the 1979 level for control agency resource supplementation. These additional funds will provide increased State and local agency activity in the development of revised State Implementation Plans (SIPs), adherence to SIP schedules for developing additional control measures, enforcement of the new SIP regulations, improved air quality monitoring, and implementation of mandatory motor vehicle emissions inspection and maintenance programs. A decrease of $50 million transportation planning grants reflects the Agency's plan to provide total funding for these programs in 1979. The decrease in training reflects the discontinuation of the academic training program.

This activity encompasses the grant resources and assistance provided to support State and local governments in implementing air pollution control programs, accomplishing national priorities and meeting requirements of the Clean Air Act. Support is provided in the form of grants to control agencies for the conduct of air pollution control planning, monitoring and enforcement activities, and to organizations of local elected officials with air quality or transportation planning responsibilities for the development of plans in nonattainment areas. Support is also provided in the form of contractual services to States, assignment of EPA personnel to State agencies, and training provided for the personnel of State and local agencies. The Clean Air Act Amendments of 1977 place increased requirements and workloads on State and local control agencies. A major task for these control agencies in 1978-1980 is the development of revised State Implementation Plans (SIP) for areas where the ambient air quality standards have not been attained. Special studies for specific pollutants, acquisition and analysis of air quality data and emission data, and development of emission limitations and other regulations are required. Plans submitted in 1979 must include emission limits reflecting reasonably available control technology and specific schedules for the adopting of other measures, including mandatory I/M programs and control of transportation sources. In 1980, action implementing these schedules must be taken and reasonable further progress maintained toward the attainment of ambient air quality standards. In 1980, emphasis will also be given to improvements in State/local air quality monitoring. In addition, State and local agencies will place added emphasis on new source review programs, particularly for the prevention of significant deterioration. Increased source inspections and expeditious enforcement actions, as well as assessment of noncompliance penalties and enforcement of NSPS/NESHAPS requirements, all requiring additional State/ local activity are anticipated.

Grants to State and local control agencies having a major role in developing and carrying out these SIP and other requirements constitute the major form of EPA resource assistance. Grants assistance is supplemented by the assignment of personnel and provision of services of contractors for specific tasks identified by the States, localities, or EPA as required for carrying out or revising the State Implementation Plan. Examples of this type of support include development of emission inventories, application of dispersion modeling techniques, special air quality monitoring, control strategy/regulation development and development of procedures necessary for implementation of mandatory I/M programs.

Control Agency Resource Supplementation -- Under the Clean Air Act, States, in partnership with local agencies are responsible for developing and implementing plans to attain and maintain ambient (air quality standards).

Training -- Resource assistance is further supplemented by the provision of training in specialized areas of air pollution control. Since July 1, 1976, the EPA Air Pollution Training Institute at Research Triangle Park, North Carolina, has been operated under contract. New courses are developed as needed, instruction manuals and materials are revised and updated, and laboratory courses at Research Triangle Park are conducted and manuals and instructional materials are provided to university field centers. A small EPA staff monitors the contract, maintains liaison with regional offices and State and local agencies, assesses changing training requirements, and ensures that those requirements are fulfilled. The EPA staff also works with regional university centers to develop State and local self-sufficiency in training by offering field courses closer to the agencies. Eventually, as many as eight to ten centers may be used.

Grants for Planning Control of Carbon Monoxide and Photochemical Oxidants in Nonattainment Areas

The general objective of the planning assistance program is to assist urban areas where national ambient air quality standards have not been attained in developing comprehensive planning and growth management processes which permit both attainment of standards and employment growth. The grants will provide funding for planning agencies to participate in the development or revisions to the State Implementation Plans for urban areas that have not attained the health protective primary standards for photochemical oxidants and/or carbon monoxide.

The Act stipulates that there can be no construction of major new air pollution

in the Nation's urban areas, especially the central cities.

The potential constraints on growth in urban areas imposed by the Clean Air Act Amendments can be avoided or minimized with the development of appropriate State Implementation Plan (SIP) revisions which provide for overall emissions reductions from new and existing sources and which provide for growth consistent with attainment of the NAAQS by the statutory deadlines.

The air quality planning and analyses that will have to be carried out to implement the Clean Air Act supplement DOT funded programs which are generally related to integrating the various aspects of transportation systems into a cohesive whole that serves an area's transportation needs. The activities eligible for funding under the Section 175 grants emphasize concerns with the air quality implication of proposed transportation system changes and are intended to encourage the undertaking of transportation measures which have a beneficial impact on air quality. These include:

- Development and evaluation of longer range alternative growth and transportation system strategies.
- Development and evaluation of shorter range transportation improvement packages --including contingency packages to best insure timely attainment of standards.
- A much more tightly managed transportation planning and programming process geared toward a regulatory product that best insures implementation of key measures.
- New planning and evaluation activities that stress not only detailed air quality assessment, but also extensive consultation activities (with other agencies, interest groups, elected officials) needed for coordination, support and timely implementation of strategies.

Measures that will have to be considered include: motor vehicle emissions inspection and maintenance; control of vapor emissions from fuel transfer and storage operations and operations using solvents; improved public transit; exclusive bus and carpool lanes and areawide carpools; long-range transit improvements involving new transportation facilities or major changes in existing facilities; control of on-street parking; construction of new parking facilities and operations of existing parking facilities for the purpose of park-and-ride lots and fringe parking; limitations of portions of road surfaces or certain sections of the metropolitan area to the use of common carriers or nonmotorized vehicles or pedestrian use, both as to time and place; employer participation in programs to encourage carpooling, vanpooling, mass transit, bicycling, and walking; secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas; staggered hours of work; road user charges, tolls, or differential rates to discourage single occupancy automobile trips; control of extended idling of vehicles; improvements in traffic flows; conversion of fleet vehicles to cleaner engines or fuels, or to otherwise control fleet vehicle operations; retrofit of emission devices or controls on vehicles and engines, other than light-duty vehicles, not subject to emission standards; and additional methods or strategies that will contribute to the reduction of mobile source related pollutants. As a result of these assessments, appropriate control measures are adopted as part of the SIP.

CONTROL AGENCY RESOURCE SUPPLEMENTATION

1978 Accomplishments

In 1978, $4.5 million in contracts and $57.5 million in grants were used to support State and local programs. States completed the designations of nonattainment areas and began the development of revisions to the State Implementation Plans (SIPs) in nonattainment areas; continued priority work on programs associated with reviews of new and/or modified sources; proceeded with compliance and enforcement work particularly in the nonattainment areas; and began restructuring and modifying the ambient monitoring networks in accordance with the Standing Air Monitoring Work Group (SAMWG) recommendations. Major efforts were directed at developing and updating emissions inventories for TSP, SO_2, and VOC sources; evaluating existing control technology for consistency with RACT;

drafting of new emission control regulations, and calibrating models for analyzing alternative strategies.

State and local control efforts were also concentrated on obtaining final source compliance with existing particulate and sulphur dioxide regulations for the balance of the estimated 22,600 Class A sources across the country. As of mid-1977, 94 percent of these 22,600 Class A sources were complying with final emission limitations or were meeting increments in compliance schedules. The Class A sources still in violation were for the most part large and recalcitrant industries, and compliance by these large volume polluters is known to be a major factor in attaining and maintaining the primary National Ambient Air Quality Standards (NAAOS) for TSP and SO_2. In addition, the control agencies placed more emphasis on compliance by some 130,000 Class B sources, particularly those in nonattainment areas.

1979 Program

The subactivity is allocated $80 million in 1979. This includes approximately $5 million of contracts and $75 million for grants. States concentrate on finalizing the revision of SIPs for nonattainment areas following the schedule set forth in CAA amendments in such a way as to minimize the application of sanctions contained in the Act. Emphasis is placed on programs for securing legislation for I/M, enactment of regulations for control of VOC from stationary sources; and the evaluation of the contribution of urban fugitive dust to nonattainment problems. Some States continue to implement EPA delegations for PSD and to adopt State specific PSD regulations as part of the SIP revision process. States move to upgrade ambient monitoring sites for adherence to SAMWG recommendations and to develop new daily air quality reporting mechanisms in conformance with the Act. States continue enforcement efforts to get Class A sources in compliance and initiated efforts to secure compliance of VOC stationary sources with the VOC emission control regulations.

1979 Explanation of Changes from Budget Estimate

The increase of $5 million over the budget estimate reflects the increased appropriation by the Congress for State/local control agency resources supplementation.

1980 Plan

The 1980 plan for this program element has been allocated $85,600,000. This represents an increase of $5.6 million which will provide increased State and local agency activity in the development of revised State Implementation Plans (SIPs), adherence to SIP schedules for developing additional control measures, enforcement of the new SIP regulations, improved air quality monitoring, and implementation of mandatory motor vehicle emissions inspection and maintenance programs. Of the $85.6 million an estimated $5 million will be utilized for direct contractor assistance to State and local agencies to continue control strategy reassessment and revision, and other technical air pollution control work.

The 1980 program will continue to support State and local air pollution control agencies with priority given for the commitments and schedules outlined in 1979 SIP submittals for: (1) enactment of additional VOC regulations; (2) fugitive dust analyses and regulations in urban areas; (3) analysis and demonstration of TCM measures; and (4) establishment of I/M. In addition, the increase will support the acquisition of additional air quality and emissions data required for the submission of approvable SIPs in 1982 for those areas given attainment date extensions for CO and O_3. SIP development for short term NO_2 and lead ambient air quality standards will be undertaken in all nonattainment areas. Funding will be provided for States willing to undertake effective new source review programs and to develop and implement plans for PSD. Emphasis will be given to laboratory and field monitoring quality assurance programs. Additional monitoring sites will be upgraded with emphases on O_3, CO, and NO_2 in urban areas. Increased State enforcement will be accelerated on new regulations for VOC sources, and new source review responsibilities.

TRAINING

1978 Accomplishments

In 1978, resources included $1,500,000 for grants and $880,000 for contracts. Grant monies were used to support universities and associated fellowships based on a forgivable loan concept, fellowships for State and local air pollution control agency personnel, an environmental management institute, motor vehicle mechanic teacher training, and an internship program for prospective control agency employees. Contractors were used to conduct short term technical training courses and workshops and to develop and revise course materials. Eighty-six short term technical training courses were conducted on 20 different subjects for 2100 trainees (a total of 9300 trainee-days) at Research Triangle Park and at other locations across the Nation. Five new courses were developed and major revisions were made to 10 courses. Self-instructional courses were provided on four subjects to 340 trainees. Sixteen workshops were held for 800 attendees, and 12 workshops were videotaped with a total of 12,000 person-viewings. Fifty-six fellowships for full or part-time study were awarded to employees from 27 State and local agencies. Thirty-eight forgivable loan traineeships were provided at 11 grantee universities. Sixty people completed the intensive environmental management institute and 24 interns were given job experience and/or educational opportunities.

1979 Program

The training program has been allocated $1,609,000 and six positions. These funds include approximately $540,000 in grants and $711,000 in contract funds. Sixty courses are conducted in 18 subjects at Research Triangle Park and at 40 locations in the field for 1400 trainees (representing 6500 trainee days). Three new training courses are being developed, five courses are being revised and four Instructors Resource Manual (IRM) packages are being developed. Self-instructional courses on four subjects are being conducted for 440 trainees. Eight workshops are planned for 400 attendees, and four videotaped workshops are being conducted for a total of 4000 person-viewings. Fellowships are granted for 25 students from 22 State and local agencies, and 32 forgivable loan traineeships are available at eight grantee universities and 16 internships are offered.

1979 Explanation of Changes from Budget Estimate

The net increase of +$547,800 results from two actions. Congress provided an add-on of $540,000 for academic training to this activity. A net increase of $7,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise.

1980 Plan

The 1980 plan includes six positions and $1,061,000, of which $711,000 has been allocated for contracts. Grants for academic training have been eliminated as emphasis is shifted to State Implementation Plan (SIP) revision activities. Contract supported training activities include: conduct 50 short term technical courses on 16 subjects for 1200 trainees (5400 trainee-days); provide 440 trainees with self-instructional courses in five subjects; prepare two new classroom courses, revise four courses and develop three IRM packages, and conduct of workshops for 350 attendees and videotape four workshops for an anticipated 4,000 person-viewings.

GRANTS FOR PLANNING FOR CONTROL OF CARBON MONOXIDE AND PHOTOCHEMICAL OXIDANTS IN NONATTAINMENT AREAS

1978 Accomplishments

The planning assistance program did not exist in 1978.

1979 Program

1979 resources are $30 million in grant funds. Grants are awarded to organizations of local elected officials in areas where local transportation related

sources contribute materially to air quality standard violations for carbon monoxide and oxidants. To be eligible for grants, these Metropolitan Planning Organizations (MPOs) must be designated by the Governor as having major responsibility for transportation and air quality maintenance planning. These funds will supplement transportation planning funds provided by the Department of Transportation to the same agencies. During 1979, the urbanized areas designated nonattainment for oxidants and/or carbon monoxide must follow a continuous, phased implementation of transportation control measures. Air quality related transportation measures must be included in the Transportation Improvement Program (TIP) and the Annual Element required by the U.S. Department of Transportation.

Specifically, the MPO's must develop appropriate data bases on ambient air quality and emissions, as well as assess the impacts on air quality of changes in transportation systems. As a result of these assessments, control measures must be adopted as formal regulatory provisions of SIP's.

1979 Explanation of Changes from Budget Estimate

The increase of $25 million results from a congressional add-on to the budget request.

1980 Plan

No additional funds are requested in 1980. The $50 million available in 1979 will support two years of effort by eligible planning agencies. In addition, funds will be available from the Department of Transportation's transportation planning grants for air quality purposes. The Department of Transportation's transportation planning process has been integrated with the Environmental Protection Agency's air quality planning requirements.

Abatement and Control

Air Quality Strategies Implementation

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Air Quality Management Implementation.....	$6,408	$6,210	$8,901	$8,710	-$191
Total.....	6,408	6,210	8,901	8,710	-191
Permanent Positions					
Air Quality Management Implementation.....	251	264	264	324	+60
Total.....	251	264	264	324	+60
Full-Time Equivalency					
Air Quality Management Implementation.....	...	...	357	357	...
Total.....	...	...	357	357	...

Budget Request

The resources requested are $8,710,000, and 324 positions. The increase of 73 positions over the 1978 level for air quality management implementation will provide for greater EPA participation in all aspects of the SIP revision process required by the Clean Air Act.

Program Description

This subactivity entails the provision of major policy direction and guidance to states in the development of strategies for the attainment and maintenance of National Ambient Air Quality Standards and the prevention of significant deterioration. It involves the review of State developed strategies for consistency with the requirements of the Clean Air Act and EPA regulations as well as the tracking of State progress in meeting the schedules set forth in these strategies in making reasonable further progress towards attaining standards by the statutory deadlines.

It also includes the development by EPA of strategies for specific geographical areas where States do not prepare adequate plans for attaining and maintaining standards; the incorporation of these control strategies into appropriate Federal regulatory action; and the interaction with State and local governments in implementing these strategies. Other major activities include the audit of State and local control agencies for adherence to Federal requirements and guidelines; consultation with State and local control agencies on specific air pollution control problems; reviewing impact of new sources of air pollution; and the management of State and local agency grant resources and their allocation.

Air Quality Management Implementation -- The Clean Air Act Amendments of 1977 specify stringent criteria for preparing State Implementation Plans (SIP) and substantially increase the number of plans required. Therefore, major efforts are required for the review and approval of the SIP and for the promulgation of plans where State plans are inadequate.

Major efforts are also necessary to provide guidance to States in meeting the commitments made in SIP submissions which are essential to the attainment of standards, establishment of mandatory automotive inspection/maintenance programs, regulation of transportation sources, control of urban fugitive dust and additional stationary source controls.

Major EPA regional office activity is also required to guide States in developing the necessary data base and strategy demonstrations which are required for the 1982 SIP submission for ozone and carbon monoxide where an extension to 1987 for attainment under the Act has been granted. This includes extensive involvement by local elected officials, metropolitan planning organizations, State transportation departments as well as the state air pollution control agencies and will require major EPA regional office coordination and participation efforts. EPA regions must participate actively in the local planning processes to assure that air quality considerations are taken into account in a meaningful way and that the local plans developed, particularly the transportation elements, are integrated into the SIP as enforceable measures in a time frame consistent with the requirements of the Act. These activities are expected to extend through 1982. Similar activities will have to be carried out to develop and review SIPs for the recently issued lead standard and for other anticipated revisions to standards as required by the Act.

The 1977 Amendments also impose major new requirements on the process for reviewing new sources of pollution to assure that they will not cause air quality to deteriorate in areas already attaining the National Ambient Air Quality Standards (NAAQS) or that they will not delay attainment, or aggravate current problems, in areas that have not yet attained the NAAQS. The determination of best available emission control technology, analysis of air quality impact, selective source siting, and emission trade-offs analyses are all integral to this review process and will require EPA regional office resources. State program assistance increases over the past two years are supporting State - assumption of these activities.

AIR QUALITY MANAGEMENT IMPLEMENTATION

1978 Accomplishments

1978 resources included no contract funds. The classification of all areas of the country as to their attainment status as required by Section 107 of the Act was completed by the EPA regions in conjunction with the States. EPA regional office work during 1978 concentrated on providing policy direction and guidance to States and assisting States in data collection and analysis for the development of the required State Implementation Plans (SIP) revisions in designated nonattainment areas, the assessment of the plans for other areas where the attainment status remained in doubt or the adequacy of the current SIP was questionable and the continuation of efforts to secure the delegation of responsibilities to States for reviewing new source permits where this responsibility resided with EPA.

1979 Program

The implementation of air quality management strategies has been allocated $8,901,000 and 264 positions. These resources include no contract funds. With these resources, the 1979 program is directed towards the SIP revisions required for nonattainment areas. States are required by the Act to submit revised SIPs for SO_2, TSP, NO_2, O_3, and CO for all nonattainment areas by January 1, 1979. EPA regional offices are providing extensive effort and guidance in early 1979 to States by preparing the final revisions for submission to EPA to insure compliance with the Act. Under the Act, EPA must then review the submissions,

and in those cases in which SIP revisions are disapproved, must promulgate acceptable SIPs. In addition, SIPs for lead are due in March 1979, and EPA must review and approve/disapprove State plans for lead by August 1979. If a SIP is disapproved, EPA must promulgate a substitute plan for lead by October 1979.

The regional offices are guiding the development and review of State regulations controlling the emissions of volatile organic compounds, as well as plans and schedules for I/M programs and TCM planning efforts. These three activities are required for an approvable O_x SIP. In addition, the regions are guiding the States in the development and review of TSP SIPs for some 397 nonattainment areas. A further major activity is the engineering and air quality review of some 1500 new sources under the PSD regulations. Where EPA currently has the responsibility, the regions are actively seeking and guiding State adoption of the PSD program to reduce the regional NSR workload by 1980.

1979 Explanation of Changes from Budget Estimate

The net increase of +$2,690,300 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$103,400. A net increase of +$1,160,700 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, a net amount of +$956,400 was transferred into this activity within the regional offices to reflect actual operating conditions as of the end of 1978 as well as the implementation of standardized accounting for regional offices' program division overhead from manpower planning and training ($741,000) and NEPA compliance/municipal waste treatment facilities construction ($164,000) activities within the water quality media, as well as from ambient air quality monitoring activity ($51,400). Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan, +$676,600 was reprogrammed to this activity from areawide waste treatment management planning/Section 208.

1980 Plan

The 1980 plan contains $8,710,000 and 324 positions for air quality management. No contract funds are included. The major efforts to be undertaken with these resources include the tracking, overview, and guidance of State efforts to implement the various schedules contained in the 1979 SIP for analysis and development of additional control measures necessary for the attainment of standards by the statutory deadlines (i.e. securing enabling legislation for mandatory I/M program; enactment of regulations for control of additional major source categories of volatile organic compound emissions; developing procedures and purchasing equipment to establish an I/M program; analysis of reasonable transportation control measures and demonstration of selected measures; and analysis and development of measures for control of urban fugitive dust). Also included is the annual review of State progress in meeting the reasonable further progress (RFP) requirement of the 1977 Amendments to the Act. The meeting of these requirements is essential to avoid imposition of sanctions specified in the Act.

In 1980, the EPA regional offices will also provide guidance and direction to States and review state submissions which result from new or revised National Ambient Air Quality Standards (Pb, O_3, NO_2, TSP). Further EPA guidance and consultation to States will be necessary in the development of the required 1982 SIP in those nonattainment areas for ozone and carbon monoxide where EPA has approved a 5-year extension for attainment of standards. In 1980, major guidance in this effort will focus upon the development of adequate data bases and capability for conducting highly complex diffusion modeling which will be required to be included in the attainment demonstration portion of the 1982 SIP.

EPA regional offices will provide essential guidance and direction to States in preparing for SIP submissions for new or revised standards including guidance in the development of the new emission inventories and other data bases which may have to be established, as well as necessary modeling capabilities to analyze alternative control strategies and demonstrate attainment.

Upon the issuance of regulations by EPA for the establishment of State new source review programs for the prevention of significant deterioration for Set II pollutant (ozone, oxides of nitrogen, carbon monoxide), EPA regional offices will likewise guide and assist States in developing an approvable SIP and programs for implementing these review requirements. Efforts in 1980 will concentrate on the initial steps required with final State preparation of required plan and program expected in 1981.

Other activities to be undertaken include the overview of all existing State new source review programs including the audit of selected State reviews to insure consistency with the requirements of the Clean Air Act and EPA regulations. EPA regions will actively assist States in developing programs for the prevention of significant deterioration for total suspended particulates and sulfur dioxide where such programs were not established in 1979. Limited guidance and direction will also be provided to States in developing required visibility protection plans for some 155 mandatory Class I areas where the Department of Interior has determined visibility to be a major factor.

Abatement and Control

Mobile Source Preproduction Compliance Verification

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Preproduction Compliance Verification.....	$ 2,811	$ 1,885	$ 2,880	$ 2,430	-$450
Emissions Testing, Analysis and Data Support for Preproduction Compliance Verification.....	3,150	2,880	2,292	1,300	-992
Total.....	5,961	4,765	5,172	3,730	-1,442
Permanent Positions					
Preproduction Compliance Verification.....	65	64	62	50	-12
Emissions Testing, Analysis and Data Support for Preproduction Compliance Verification.....	47	47	47	21	-26
Total.....	112	111	109	71	-38
Full-time Equivalency					
Preproduction Compliance Verification.....	...	...	71	59	-12
Emissions Testing, Analysis and Data Support for Preproduction Compliance Verification.....	...	...	52	28	-24
Total.....	...	...	123	87	-36

Budget Request

The resources requested by this budget subactivity are 71 positions and $3,730,000. This reflects a reduction of 38 positions and $1,442,000 made possible by full implementation of an abbreviated certification program.

Program Description

This subactivity includes: (1) engineering review and confirmatory testing of prototype motor vehicles and engines in order to certify their compliance with emission standards, and (2) related technical and data processing support.

EPA is currently developing improvements to its certification program. In previous years, motor vehicle manufacturers' complete lines of vehicles and engines have undergone the full certification process. However, the potential air quality impact of improperly certifying a vehicle is not equal for all manufacturers or engine families. Rather, the air quality risk is related to the degree of failure and the number of vehicles sold. Consequently,EPA has undertaken reforms to this program which will reduce the paperwork, reporting, and testing burdens on the automobile, truck, and motorcycle industries, while at the same time improving the control of emissions from motor vehicles.

The certification process involves the manufacturers' submission to EPA of applications; the development of emissions performance information by manufacturers or EPA on the basis of prototype vehicle testing; and the review of these data by EPA for the purpose of determining compliance with standards. Certification testing also results in the generation of vehicle fuel economy data. These data are the foundation of EPA's fuel economy public information activities (carried out jointly with the Department of Energy), and are used to support the Department of Transportation's program of compliance with fuel economy standards as required by the Energy Policy and Conservation Act.

Manufacturers submit a Part I application for certification to EPA describing vehicles and engines which they plan to offer for sale. In the forthcoming streamlined compliance review process, EPA will decide which engine families are to receive full certification review and which are to be subject to abbreviated review. This determination will be based on considerations of projected sales, changes in technology, the past performance of the manufacturers' laboratories in providing accurate emissions data, assembly line testing data, and in-use emission performance.

For those engine families selected for full review, EPA indicates what actions manufacturers must take to demonstrate compliance with emission standards, and assures the acceptability of proposed procedures for mileage accumulation, emission testing and maintenance of vehicles and engines. EPA personnel carry out surveillance of manufacturers' testing. During site visits to manufacturers' facilities, EPA personnel also inspect the procedures and controls used by the manufacturers to insure that their facilities and certification procedures comply with Federal requirements and that data submitted to EPA are obtained using valid procedures. At various points in the mileage accumulation process, EPA chooses prototypes for testing in its own laboratories to provide a check on manufacturer testing.

After completion of the testing program, including confirmatory testing at the EPA laboratory, manufacturers submit a Part II application summarizing the certification test results. Approval of this application involves final review of test data, scrutiny of manufacturers' engineering reports, calculation of deterioration factors to ensure that emission levels do not exceed the applicable standard at 50,000 miles, and the final decision to certify an engine family. Certification review also entails the review of manufacturers' maintenance instructions to the ultimate purchaser, as well as manufacturers' service and technical bulletins.

After the issuance of the certificate of conformity, manufacturers are permitted to submit requests for "running changes" to their certified products to reflect technological changes and alterations in product lines. Review of running changes may involve, at EPA's discretion, additional testing at the manufacturers' facility or the EPA facility. Since running changes are approved after the certificate of conformity has been issued and vehicles may be in production, their impact on changing emissions is monitored closely by EPA.

For those engine families not selected for full review, an abbreviated certification program carried out by the manufacturers will replace the previous EPA review and approval, with compliance to be assured by an EPA audit. As with the full certification review process, the manufacturers are responsible for complying with the regulations, but the amount of EPA involvement is reduced to a minimum. The audit team inspects the documentation of the manufacturers' certification process, and confirms results through selective EPA testing. (Certification testing workloads are summarized in Tables 1 and 2.)

Table 1

Number of Certification
Tests at EPA by Vehicle Type

Vehicle Type	1978	1979	1980
Emission Data Vehicles...	1,113	700	700
Durability Vehicles.....	175	...	...
Fuel Economy Data Vehicles	175	...	...
Running Change Vehicles..	415	300	300
Total.....	1,878	1,000	1,000

Table 2

Number of Certification
Tests at EPA by Model Year

Model Year	1978	1979	1980
1977.....	5	...	...
1978.....	598	...	...
1979.....	1,275	320	
1980.....	...	580	320
1981.....	...		580
Total.....	1,878	1,000	1,000

MOBILE SOURCE PREPRODUCTION COMPLIANCE VERIFICATION

1978 Accomplishments

1978 resources included $450,000 in contract funds for data processing and analytical support.

The major accomplishment of 1978 was the development of the revised certification program as part of EPA's regulatory reform initiative. Restriction of the full review process to those engine families with the greatest air quality impact will improve the program while reducing the resources committed to it.

The savings for manufacturers due to these changes in the areas of vehicle shipment, test monitoring and administrative support are expected to amount to between $2-3 million each year. The savings in time should also be significant. Manufacturers should be able to spend more time in improving their products, assuring their marketability earlier than has been the case under the former process, and reducing redundancy in the testing of some of their durability vehicles. Manufacturers could save an additional $6.0 million in this manner. Overall, therefore, manufacturers could save from $8-9 million from these changes in the certification process.

The benefits to the government will also be substantial. By concentrating on those engine families with the greatest impact on air quality, EPA will be able to carry out its preproduction compliance program more efficiently and productively. This will result in an improvement in the quality of EPA's overall emission compliance efforts.

Another important effort undertaken in 1978 was a program to increase the computerization of the certification process. It is anticipated that this measure will improve the accuracy of the process as well as reduce the paperwork burdens associated with it. Also in 1978, a change in the method of reporting fuel economy data improved the correlation of EPA's consumer information with actual in-use results.

1979 Program

The 1979 level of resources is $2.8 million (including $1.0 million in contract funds) and 62 positions. Among contracted efforts will be:
development of a computer assisted engineering and emissions data review program (which allows the major motor vehicle manufacturers to submit information on computer compatible media); services aimed at reducing the time it takes to process applications for certification submitted by manufacturers; and a package of montechnical support.

The 1979 certification process must take into account new stricter standards for hydrocarbons (HC) and carbon monoxide (CO) for model year 1980 light duty vehicles. Technological changes in the automobile industry are being addressed through the development of criteria for engineering review of vehicles using electronic control systems. All this is to be carried out while the certification process itself is being gradually revised to improve its effectiveness and reduce its burden.

The heavy duty engine program consists of engineering review of manufacturers' design information on new engines to identify engine configurations for durability testing and potentially high polluting engine configurations for emission data testing. A full review program is being conducted for the four motorcycle manufacturers with the highest volume of sales.

EPA continues to support the Department of Transportation fuel economy regulatory program in 1979. Highway fuel economy tests are being run on vehicles tested for emissions compliance to assure the validity of manufacturers' data. City fuel economy tests are also being run on vehicles, and review of manufacturer submitted data for engine classes not reviewed for emissions control purposes are being performed.

The net increase of +$995,300 results from several actions. Congress provided an add-on of $300,000 for mobile certification. A net increase of +$80,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, +$615,000 was reprogrammed within this activity from emission testing, analysis, and data support/preproduction compliance verification.

1980 Plan

In 1980 resources for this program element will be $2.4 million and 50 positions. Contracted support of $900,000 will include implementation of the computer assisted engineering and emission data review program developed in 1979.

Light duty vehicles with lower air quality impact will be subject to abbreviated review, while the complete engineering review and testing process will be performed on those engine families with the highest sales and greatest air quality impact. Criteria for the review of vehicles using electronic control systems, set to be further refined in 1979, will be implemented in 1980, as will parameter adjustment regulations (aimed at reducing the adjustability of idle mixture and initial choke settings). Control of hazardous emissions by manufacturers will be encouraged through a program of engineering review and testing. 1980 also marks the onset of new light duty vehicle standards for carbon monoxide, oxides of nitrogen, and evaporative hydrocarbons, as well as a control program for vehicles to which high altitude standards apply.

For heavy duty engines, the 1980 program continues the review process implemented in previous years. Manufacturers' design information on new engines will be reviewed to identify engine configurations for emissions data testing. A full review program will be conducted for the few motorcycle manufacturers with the highest volume of sales.

Support to the Department of Transportation's fuel economy program will continue in 1980.

EMISSION TESTING ANALYSIS AND DATA SUPPORT FOR PREPRODUCTION COMPLIANCE VERIFICATION

1979 Accomplishments

1978 resources included $600,000 in contract funds for support of emission testing and data processing activities.

1979 Program

The 1979 level of resources is $2.2 million and 47 positions. These resources include $690,000 in contract funds for support of laboratory and data processing activities associated with emission certification and fuel economy compliance.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$587,800 results from several actions. A net increase of $27,200 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. Also, as a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, -$615,000 was reprogrammed within this activity to mobile source preproduction compliance verification to support efforts to revise the certification process, as well as standard setting and in-use vehicle controls required by the 1977 Amendments.

1980 Plan

The 1980 level of resources for testing and data analysis and support will be $1.3 million and 21 positions. This includes approximately $400,000 to support operations of the emissions testing laboratory.

Abatement and Control

Trends Monitoring and Progress Assessment

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Ambient Air Quality Monitoring.....	$2,175	$3,230	$2,399	$2,209	-$190
Air Quality and Emissions Data Analysis and Progress Assessment.....	2,011	2,845	2,076	2,021	-55
Total.....	4,186	6,075	4,475	4,230	-245
Permanent Positions					
Ambient Air Quality Monitoring.....	85	85	85	85	...
Air Quality and Emissions Data Analysis and Progress Assessment.....	43	58	43	43	...
Total.....	128	143	128	128	...
Full-time Equivalency					
Ambient Air Quality Monitoring.....	...	...	94	89	-5
Air Quality and Emissions Data Analysis and Progress Assessment.....	...	...	50	50	...
Total.....	...	...	144	139	-5

Budget Request

The resources requested are $4,230,000 and 128 positions. The decrease of $190,000 reflects a shift in regional office workload. The decrease of $55,000 reflects a slight reduction in contracts.

Program Description

This subactivity covers work related to monitoring ambient air quality levels and air pollution source emission levels, determining and analyzing their relationships, and assessing the program made toward the attainment of environmental goals.

Ambient Air Quality Monitoring -- Activity in this program includes EPA's ambient air monitoring operations carried out by regional offices, the requisite associated laboratory support, and special field monitoring studies. Most ambient air quality and source monitoring is carried out by State and local agencies which provide these data to EPA. The regional offices oversee State monitoring efforts, develop and carryout quality control programs to assure the

quality and consistency of State data, and process and evaluate data submitted to EPA by the States. Determination of attainment or nonattainment of ambient air quality standards is made on the basis of these data. It is expected that monitoring activities and data analyses will increase due to the need for continuously reassessing the State Implementation Plans (SIP) in nonattainment areas as to their adequacy to attain ambient air quality standards, and the need to develop revised control plans. In addition to the monitoring for criteria pollutants required by the SIP, a limited program to acquire available State data on currently unregulated pollutants is also being carried out. These data aid in understanding relationships beteen sources and receptors of currently unregulated pollutants, and are used for making long and short term trends analyses supportive of decisions on the need for control.

This program also includes efforts directed at improving State and local monitoring programs. To ensure State/local compliance with the technical guidelines developed by EPA headquarters relative to areas such as monitor placement and network design, the regions will be actively involved in overseeing State/local implementation of the comprehensive and largely mandatory regulations for air quality surveillance and reporting to be promulgated in 1979. Adherence to these criteria should promote uniformity of siting, ensure that the several objectives of the State and local networks are met and produce ambient data of uniformly higher quality.

Air Quality Emissions Data Analysis and Progress Assessments -- Major activities include the preparation of the annual and special reports on air quality and emission trends, special analyses on the status of attainment of the National Ambient Air Quality Standards (NAAQS), development and dissemination of new or improved techniques for data analysis, and collection and analysis of emission data. Also included are the development, updating, and maintenance of systems for storage and retrieval of air quality and emissions data gathered by monitoring activities. The data systems are composed mainly of an inventory of point sources and their emissions, and software and related procedures for storing and disseminating ambient air quality and emissions data. To assist the States in efficient and timely submission of data to EPA, continuing support is provided to the 30 State and local agencies using the Comprehensive Data Handling System.

AMBIENT AIR QUALITY MONITORING

1978 Accomplishments

1978 resources included essentially no contract funds. Technical guidance and direction were provided to State and local agencies to ensure that State and local monitoring sites operated properly and generated valid data. Data generated by States and localities was edited and verified. Activities concentrated on auditing all State laboratories and evaluating selected State/local networks and monitoring sites. EPA continued to encourage State and local agencies and and regional councils to use the standardized air quality index developed in 1976. A Federal/State program for rapid collection and analysis of ambient data for nonregulated pollutants was continued in order to ensure their availability for national assessments of the need for control or for determing trends for these pollutants.

1979 Program

The development of ambient air quality data and field monitoring operations is allocated $2,398,900 and 85 positions. These resources include essentially no contract funds. The major thrust of the 1979 program is to evaluate a substantial portion of the monitoring networks and individual stations operated or planned by State/local agencies. Regional staffs play a key role in designating the approximately 1000 State/local stations to be included within EPA's network of National Air Monitoring Stations (NAMS) and the 5000-6000 stations to comprise the networks of State and local Air Monitoring Stations (SLAMS) and in developing schedules for making these networks fully operational and in compliance with all EPA criteria. The submission and validation of data from the States continues. In an effort to improve and document the quality of data used for SIP revisions and regulatory decisions, the quality assurance program is receiving increased attention, with special emphasis on the auditing of individual sites and State laboratories. Regional staffs technically oversee the development of written plans for expanded State/local quality assurance programs to be implemented in 1980 and 1981.

The EPA regional staff is beginning the coordination necessary to have daily reporting of air quality in all major urban areas greater than 500,000 by the end of 1980. EPA staff is also continuing its involvement in special monitoring studies for noncriteria pollutants both in quality assurance and sample collection.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$831,100 results from several actions. A net increase of +$242,100 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, -$51,400 was transferred from this activity within the regional offices to reflect the implementation of standardized accounting for regional offices' program division overhead. Finally, as a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, -$498,700 was reprogrammed from this activity to emission standards and technology assessment ($292,100) and emission testing analysis and data support ($206,600) within the air media -$324,900 to environmental standards within the radiation media; -$36,600 to regional noise program within the noise media and -$161,600 to agencywide support.

1980 Plan

Resources for the 1980 program total $2,208,400 and 85 positions including $21,000 in contract support. A total of 3550 site evaluations of National Air Monitoring Stations (NAMS) and State and Local Air Monitoring Stations (SLAMS) will be performed, with emphasis on sites in major urban areas not attaining standards. All State networks will be reviewed for adequacy in terms of number of sites and thier geographical distribution. Regions will perform detailed reviews of State quality assurance programs including on-site audits of all State laboratories. All regional laboratories will particulate in ORD's national performance surveys. The regions will also coordinate daily reporting of air quality as required by Section 319 of the Clean Air Act in urbanized areas greater than 500,000 population.

AIR QUALITY AND EMISSIONS DATA ANLAYSIS AND PROGRESS ASSESSMENT

1978 Accomplishments

1978 resources included approximately $650,000 in contract funds. The National Air Quality and Emissions Trends Report, 1976 was published. Regulations were proposed that require the standard air quality index to be used in State monitoring programs. A Federal-State program for collection and analysis of ambient data for nonregulated pollutants was continued. The development of a rapid capability for obtaining air quality information for special studies was planned. Computer software providing expanded retrieval and analysis capabilities was developed and distributed to all State and local users of the Comprehensive Data Handling System (CDHS). Regulation for the siting of ambient air quality monitors was proposed. In addition, advanced computerized techniques for graphical analysis and display of county/State/national air quality were developed; guidance on development of quality control checks for screening air quality data, on developing ambient concentration isopleths, and on the use of meteorological data in air analyses were published; and air quality isopleths and population exposure assessments were prepared for eight cities.

1979 Program

The assessment of environmental trends and progress of control programs has been allocated $2.07 million and 43 positions. These resources include approximately $620,000 in contract funds. Major emphasis is given to national management of the 5-year plan for implementing the recommendations of Standing Air Monitoring Work Group (SAMWG) and carrying out Section 319 of the CAA Amendments of 1977. These requirements are reflected in new regulations for monitoring and reporting to be promulgated in 1979. A major goal of these regulations is to establish a national air monitoring network which generates high quality data and is operated by State and local agencies using nationally uniform methods. Effective implementation involves national oversight, the provision of technical guidance to the regional offices and the development of new software to facilitate reduced State reporting. Key activities include assuring the NAMS are being established in a nationally uniform manner, and preparing periodic assessments of the plans and first year progress of the implementing SAMWG's recommendation and the regulations.

Current programs to assess and report the Nation's progress in achieving National Ambient Air Quality Standards (NAAQS) and to operate EPA 's national air data systems continue. Substantial efforts continue toward making the States more self-sufficient in data handling and analysis by increasing the capabilities of the EPA developed systems used in 30 State and local agencies and providing use of these systems to additional agencies via an EPA computer.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$768,400 results from several actions. A net increase of +$117,100 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. Also, as a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, -$885,500 was reprogrammed from this assessment ($40,300) and State program guidelines and regulations development ($845,200) within this medium.

1980 Plan

The 1980 plan for this program element includes: $2.02 million and 43 positions. Contract funds represent $620,000. Major program emphasis will include data storage, processing and retrieval; development and maintenance of systems used for data processing; deteriminations of trends in air quality and emissions; development of standard operating procedures and regulations for ambient monitoring stations operated by State and local agencies; and management of the National Air Monitoring Stations (NAMS). In-house efforts will be complemented by contract support in most areas.

Specifically, a comprehensive audit of 150 NAMS will be performed. Findings from these audits will serve as a primary source of data for assessment of NAMS and provide clear documentation for the corrective actions needed to comply with EPA criteria. Trend data from NAMS will be coded to indiate reliability of trends based on accuracy data collected as part of the EPA/State quality assurance program. New software and related procedures which can display data graphically will be developed and made available to States. National air quality baseline statistics needed to project air quality impacts of alternative national energy strategies, revised national ambient standards, revised Federal automotive standards, and new source performance standards will be developed.

Enforcement

AIR

Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
			(dollars in thousands)			
Appropriation						
Stationary Source Enforcement.....	$16,077	$24,363	$24,362	$25,030	+$668	A-77
Mobile Source Enforcement.....	4,733	5,492	6,143	6,851	+708	A-81
Total.....	20,810	29,855	30,505	31,881	+1,376	
Permanent Positions						
Stationary Source Enforcement.....	366	502	471	502	+31	
Mobile Source Enforcement.....	115	158	138	138	...	
Total.....	481	660	609	640	+31	
Full-time Equivalency						
Stationary Source Enforcement.....	...	...	500	517	+17	
Mobile Source Enforcement.....	...	...	151	158	+7	
Total.....	...	...	651	675	+24	

Purpose

The air enforcement program is directed toward achieving compliance with the standards and regulations established for stationary and mobile sources of air pollution under the provisions of the Clean Air Act. The stationary source enforcement program is undertaken to bolster and stimulate State enforcement of State Implementation Plans (SIP), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP). The mobile source enforcement program is primarily a Federal effort directed toward achieving compliance with fuel and moter vehicle emission standards and regulations.

EPA's stationary source enforcement program consists of bolstering and stimulating State efforts to ensure compliance with SIP requirements with special emphasis on major (Class A) sources and responding to situations involving substantial threats to public health and safety, thus contributing to the resolution of attainment problems. Also, emphasis is placed on implementing Clean Air Act provisions relating to sources issued prohibition orders by the Department of Energy under the Energy Policy and Conservation Act, and enforces SIP, NSPS, NESHAP requirements to ensure emission standards are being met.

EPA initiated a major source enforcement effort in 1978 to expedite the compliance of recalcitrant Class A violators. This program is consistent with the Clean Air Act Amendments' philosophy of no longer relying primarily on the administrative order process for establishing compliance schedules for Class A violators, and also with the provisions for mandatory civil actions for major noncomplying sources. Also, EPA will be seeking administratively imposed penalties to remove the incentive for continued noncompliance in appropriate cases. To obtain such penalties, EPA or a delegated State is required under Section 120 to give notice of noncompliance to Class A sources which are not in compliance by July 1, 1979, or 30 days after discovery of the violation, whichever is later, and then to assess a penalty.

The mobile source enforcement program will be placing high priority on programs aimed at reducing the failure of vehicles to meet emission standards at the time of sale and while in use. The 1980 program will focus on continued implementation of the Selective Enforcement Auditing assembly line testing program, recall and surveillance activity in support of recall, and warranty enforcement. A new strategy will place emphasis on enforcement of the antitampering and fuel switching provisions concentrated primarily in areas of the country with significant mobile source pollution problems requiring implementation of inspection/maintenance (I/M) programs to meet air quality standards. The program includes support of the Denver Clean Air Initiative as well as targeted areas needing I/M. The nationally coordinated antitampering and antifuel switching efforts will be directed toward vehicle fleets, new car dealerships, auto repair facilities, and service stations in potential I/M areas.

AIR

Enforcement

Stationary Source Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Stationary Source Enforcement.....	$16,077	$24,363	$24,362	$25,030	+$668
Permanent Positions					
Stationary Source Enforcement.....	366	502	471	502	+31
Full-time Equivalency					
Stationary Source Enforcement.....			500	517	+17

Budget Request

An appropriation of $25,029,800 and 502 positions is requested for 1980. This represents an increase of $667,500 and 31 positions over 1979. The additional resources will be used to increase the pace of implementation of the Clean Air Act Amendments of 1977, primarily those provisions relating to mandatory civil actions against major source violators and those establishing administratively imposed noncompliance penalties.

Program Description

The stationary source air enforcement program is designed to utilize effectively the enforcement authorities provided by the Clean Air Act, as amended in 1977, to ensure nationwide compliance with State Implementation Plans (SIPs), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP). EPA's stationary source enforcement program consists of bolstering and stimulating state efforts to ensure compliance with SIP requirements with special emphasis on major (Class A) sources and enforcement actions in response to situations involving substantial threats to public health and safety, thus contributing to the resolution of attainment problems. Also emphasis is placed on implementing Clean Air Act provisions relating to sources issued prohibition orders by the Department of Energy under the Energy Policy and Conservation Act, and enforcing NSPS, and NESHAP requirements to ensure emission standards are being met.

EPA initiated a major source enforcement effort in 1978 to expedite the compliance of recalcitrant Class A violators. This program consistent with the Clean Air Act Amendments' philosophy of no longer relying primarily on the administrative order process for establishing compliance schedules for Class A violators, and also with the provisions for mandatory civil actions for major noncomplying sources. Also, EPA will be seeking administratively imposed penalties to remove the incentive for continued noncompliance in appropriate cases. To obtain such penalties, EPA or a delegated State is required under Section 120 to give notice of noncompliance to all Class A sources which are not in compliance by July 1, 1979, or 30 days after discovery of the violation, whichever is later, and to establish a penalty for continued noncompliance. Much effort will be made in 1980 to carry out this program (to be initiated in late 1979) and to delegate this program to as many States as possible.

The responsibility for enforcement of State developed, EPA approved emission limitations is shared by EPA and the States. The Clean Air Act, as amended in 1977, states that the primary responsibility for achieving Clean air lies with State and local governments, but

grants, by providing specialized skill and expertise and special contractual assistance, and by taking the primary enforcement role with respect to selected sources when the States cannot or will not enforce.

EPA has primary responsibilities for the enforcement of the Federal emission standards it promulgates. However, both Section III, New Source Performance Standards (NSPS), and Section 112, National Emission Standards for Hazardous Air Pollutants (NESHAPS), provide for State enforcement of all or any portion of these standards. In accordance with the intent of the Act, EPA continues to place a high priority on delegating enforcement authority for NSPS and NESHAP to the States. After delegation, EPA actively monitors the enforcement of these standards to assure national consistency as intended by these provisions.

1978 Accomplishments

Contract expenditures for 1978 totaled $5,513,400 including approximately $2,323,100 for enforcement case support; $2,020,200 for compliance monitoring and field surveillance support; $230,000 for regional data system support; and $940,100 for regional industrial studies support, national profiles, and enforcement strategies.

Major program accomplishments for 1978 were:

- Implementation of the major source enforcement effort and referral of 120 facilities the Department of Justice for Civil action in 1978.
- The Class A source inventory increased from 23,033 to 24,036 sources.
- 91 percent of the Class A sources were in compliance with emission standards; 8 percent are in violation of emission standards of which 3 1/2 percent are meeting compliance schedules; and 1 percent are of unknown status.
- Completion of 1,905 inspections throughout the year.
- Maintenance of 91 percent compliance level for sources of hazardous pollutants.
- Maintenance of 88 percent compliance level for NSPS sources.
- Issuance of 800 new source permits for NSR and PSD sources.

1979 Program

The 1979 resource level for this activity is $24,362,000 and 471 positions. Planned contract expenditures are $12,366,200, including $5,211,200 for enforcement case support; $4,535,000 for compliance monitoring and field surveillance; $495,000 for regional data system support; $1,600,000 for regional industrial studies support; and $515,000 to support development of national compliance profiles and enforcement strategies. During 1979, the 471 positions will be distributed approximately as follows: 7 percent for SIP revisions and nonattainment strategies, 63 percent for Class A enforcement, which includes establishing a noncompliance penalty program, 17 percent for the new source program, 4 percent for energy-related authorities, and 9 percent for the National Emission Standards for Hazardous Air Pollutants (NESHAP) program and other noncriteria pollutant programs.

Major program accomplishments during 1979 will be to:

- Complete the first phase of the major source enforcement effort by referring the remaining cases to the Department of Justice, now estimated to be 107 actions.
- Improve State Implementation Plan (SIP) compliance of emission limitations by Class A sources with present total suspended particulates and sulfur dioxide regulations to 93 percent.
- Conduct over 2,000 inspections.
- Develop strategy to ensure sources are in compliance with the new hydrocarbon regu-

- Implement noncompliance penalty program.

- Initiate enforcement actions against vinyl chloride sources found to be in violation of NESHAPS regulations.

- Conduct audits to assure adequacy of State enforcement programs for new source review programs, including review of State permits issued.

- Evaluate and recommend improvements in State field surveillance and compliance monitoring programs.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$500 results from several actions. First, Congress applied a $3 million reduction for position lapse rate to the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$290,400. An increase of +$1,218,200 is due to increased pay costs associated with the October 1978 (1979) pay raise and the distribution costs of the October 1977 (1978) pay raise. This increase is offset by the transfer of -$700,000 to other Agency activities to support the cost of the most recent pay raise. Finally, -$228,300 was transferred from this element to regional mobile source enforcement activities to reflect actual operating conditions at the end of 1978.

1980 Plan

The 1980 budget for this activity is $25,029,800 and 502 positions, an increase of 31 positions and $667,500 over 1979 levels. The increase will provide resources to carry out the requirements of the Clean Air Act Amendments of 1977. The distribution of the total resources requested for 1979 will be approximately 65 percent devoted to various aspects of Class A compliance, including the imposition of noncompliance penalties under Section 120, 17 percent to new source programs, 10 percent to National Emission Standards for Hazardous Air Pollutants (NESHAPS) and other noncriteria pollutant programs, 5 percent to nonattainment strategies and State Implementation Plans (SIPs) revisions, and 3 percent to energy related programs.

As a result of the changes to the basic enforcement approach for dealing with Class A violators, mandated by the Clean Air Act Amendments of 1977, there will be a substantial increase in the number of civil/criminal actions required against Class A violators and the issuance of noncompliance penalties (NCPs) to virtually all Class A violators. In 1978, the major source enforcement effort was implemented and 120 facilities were referred to the Department of Justice for civil action. During 1979, an estimated additional 107 facilities will be referred to DOJ for civil action. Consequently, the emphasis in 1980 will be on the expeditious conclusion of the remaining settlement/litigation actions. Besides the civil/criminal actions associated with the major source enforcement drive, there will be many anticipated enforcement actions against major sources who were once in compliance but will slip out of compliance, sources who will be in violation of new SIPs, and new sources who will be violating NSR, NSPS and PSD regulations. While mandated court actions increase the resource demands on EPA, since litigation is more resource intensive than administrative enforcement, the resulting benefit from expeditious compliance and air quality improvement justifies the resources it demands.

The issuance of NCP's is also resource intensive. NCP's must be developed for all Class A sources (except certain smelters under Section 119 orders) not meeting SIP requirements or not meeting interim control requirements. In addition, NCP's must be issued to those sources violating New Source Performance Standards (NSPS) or NESHAP requirements. EPA will have an estimated 700 NCP's to issue in 1980.

Consequently, much of the increased resources for 1979 will be devoted to the implementation of this powerful new tool for obtaining expeditious compliance, and also facilitating delegation of Section 120 authority to the states.

The concept of preventing regression from achieved levels of compliance applies to all stationary source enforcement programs. Failure to support an effective program by ensuring the continued compliance of sources with either emission limitations or compliance schedule

The budget request reflects a continuing commitment to a strong field surveillance program with a continuing use of contractors for much of this element of the program. It should also be noted that EPA intends to expand substantially its program for continuous monitoring in the future, which should ultimately lead to more effective compliance monitoring with ultimately less resources devoted to that effort.

SIP revisions will be submitted for the large areas of nonattainment, especially for hydrocarbon and particulates, in early 1979. These SIP revisions will be promulgated before and during 1980, which will increase the inventory of Class A SIP sources by 4,000 hydrocarbon sources in 1980 and the promulgation of additional hydrocarbon regulations through 1981 will increase the inventory of Class A sources by 12,000, approximately a 50 percent increase in the present inventory. EPA has the responsibility of ensuring all Class A sources are in final compliance with SIP revisions within three years.

An area of increasing focus is the relationship and balance between environmental and energy concerns. The Power Plant and Industrial Fuel Use Act of 1978 prohibits, with exemptions, new power plants and new major fuel burning installations from using, as a primary energy source, natural gas or petroleum. Also prohibited is the construction of these new sources without the capability to use coal or an alternate fuel as a primary energy source. Exemptions will be granted by the Department of Energy (DOE) where environmental requirements could not be met if coal is burned as the primary energy source. EPA must work with DOE to ensure that these new sources are constructed in accordance with NSR, NSPS, and PSD requirements. In addition, certain existing power plants that have the technical capability to use coal or another alternate fuel may be issued a prohibition order; thus, EPA enforcement will have to renegotiate compliance methods and schedules to ensure that, upon conversion, these sources still meet environmental standards.

Considerable attention will be devoted to new source programs which will deal with the regulation of new sources to permit new construction or expansion of industrial sources in a manner consistent with attainment and maintenance of air quality standards and prevention of significant deterioration of current air quality in clean areas.

Consistent with the intent of Congress expressed in the Clean Air Act Amendments, the scope of coverage of the offset policy has recently been expanded. The SIP revisions to be submitted in 1979 will have offset provisions, thus making the States responsible for the new source review permitting program. EPA will have to carry out an effective overview program to ensure the quality, enforceability, and fairness of these permits.

Similar concerns exist with respect to the prevention of significant deterioration (PSD) of air quality in areas that are presently in attainment. EPA has expanded the number of sources subject to the PSD regulations as directed by the Clean Air Act Amendments of 1977. Much effort will be devoted to working with States to develop acceptable PSD regulations so that they can assume primary responsibility for the program with EPA limiting as much as possible its role to one of assistance to the State and local permitting authorities and to monitoring State efforts, as appropriate. By the end of 1979, approximately half of the PSD activities should be carried out by the states and by the end of 1980, the states should have responsibility for most of the PSD program.

Another element of the overall program for dealing with new sources is the establishment and enforcement of NSPS. Thirty-three categories of sources were regulated under NSPS at the end of 1978, an estimated three additional categories of sources will be added in 1979 and 13 in 1980. This will result in a substantial increase in the number of regulated sources.

In line with EPA's increasing attention to toxic substances, increased emphasis is being placed upon hazardous air pollutants subject to regulation under Section 112. EPA, in 1979 and 1980, plans to implement new NESHAP programs; thus increased enforcement efforts will be required.

Contract funds requested for 1980, totaling nearly $12,434,500, include $5,379,500 for enforcement case development, $4,735,000 for compliance monitoring and field surveillance, $1,310,000 for regional industrial technical and economic studies, $515,000 for national profiles and enforcement strategy studies, and $495,000 for data support.

Enforcement

Mobile Source Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Mobile Source Enforcement.....	$4,733	$5,492	$6,143	$6,851	+$708
Permanent Positions					
Mobile Source Enforcement.....	115	158	138	138	...
Full-time Equivalency					
Mobile Source Enforcement.....	...	...	151	158	+7

Budget Request

The 1980 mobile source enforcement budget request provides an increase of $708,000. In 1980, a new mobile source in-use strategy will be introduced to target violations of the tampering and fuel switching provisions and support the Denver air initiative. A team of 16 term personnel and 21 permanent employees managed from headquarters and operating out of two field offices will conduct inspections of private and municipal fleets, perform new car dealership inspections, and utilize test vehicles to deter tampering and fuel switching in areas targeted for inpsection/maintenance programs.

Program Description

The mobile source enforcement program is directed primarily toward achieving compliance with motor vehicle emission standards and fuels regulations.

The major objectives of the program are to (1) assure that new vehicles meet emission standards; (2) assure that vehicles meet emission standards in-use; (3) assure that emission control systems are not removed or rendered inoperative; (4) assure compliance with vehicle miles traveled (VMT) measures; (5) assure control of hydrocarbon emissions during gasoline transfer operations; (6) assure that harmful additives are removed from gasoline; (7) administer California waivers; and (8) administer the emission waivers.

1978 Accomplishments

In 1978, the mobile source enforcement program continued to carry out its responsibilities under Title I and Title II of the Clean Air Act by emphasizing programs aimed at reducing the failure of vehicles to meet emission standards. In 1978, the mobile source enforcement program issued 33 Selective Enforcement Audit test orders to manufacturers to test vehicles on the assembly line. Twenty-seven recall investigations were completed resulting in the recall of 1,970,000 vehicles. Manufacturers' certification and production compliance procedures were enforced by conducting 25 inspections and five investigations. The tampering provisions were enforced by performing 90 investigations. Two thousand service station inspections were conducted to assure compliance with the Stage I vapor recovery provisions, 21,000 unleaded gasoline inpsections were conducted, 560 complaints were issued, and $250,000 were collected in penalties as a result of regional enforcement activity. A survey of 6,000 refuelings was conducted to determine the rate at which vehicles requiring unleaded gasoline are being fueled with leaded gasoline and indicated that a rate of 10 percent fuel

Approximately $1,810,900 in contract funds were obligated in 1978 in support of recall emission testing, METFac, computer program support, antitampering publicity, tampering and fuel switching, surveys, vehicle testing, assistance to States for the unleaded gasoline and vapor recovery programs, and assistance to States and regions for implementation of inspection/maintenance (I/M) programs.

1979 Program

In 1979, efforts in the program will be focused on reducing the failure of vehicles to meet emission standards. The program will continue to emphasize the Selective Enforcement Audit assembly line testing program and recall with increased testing and investigative activity as a result of expanded surveillance activity.

The major activities will be to expand the assembly line testing activity for light-duty motor vehicles and to establish assembly line testing for heavy-duty engines; implement warranty regulations, develop maintenance instruction regulations, and implement the aftermarket part certification program; administer the emission waivers; expand the antitampering program, and reduce the improper use of leaded gasoline.

The enforcement activities will be to issue 35 Selective Enforcement Audit vehicle test orders; conduct 35 recall investigations; conduct 20 warranty investigations; initiate a new antitampering strategy directed at supporting the adoption of I/M programs in major urban areas; review enforceability of State Implementation Plans and Transportation Control Plans; conduct 50 imports investigations; prevent the introduction of leaded gas into vehicles designed for unleaded by conducting inspections of fleet facilities and retailers; and enforce Stage I vapor recovery provisions.

Approximately $2,478,100 of contract funds will be utilized in support of recall emission testing, unleaded fuels inspection and sampling assistance, tampering, publicity campaign and METFac.

1979 Explanation of Changes from Budget Estimate

The net increase of +$650,400 results from several actions. First, Congress applied a $3 million reduction for position lapse rate to the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$56,100. Second, an increase of +$357,100 is due to increased pay costs associated with the October 1978 (1979) pay raise and the distribution of the October 1977 (1978) pay raise. Third, +$228,300 was transferred to this element from stationary source enforcement activity within regional offices to reflect actual operating conditions at the end of 1978. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$121,100 was reprogrammed to this element and is attributed to a reduction in regional drinking water enforcement.

1980 Plan

The 1980 mobile source enforcement budget request provides for an increase of $708,000. In 1980, a new mobile source in-use strategy will be introduced to target violations of the tampering and fuel switching provisions and support the Denver air initiative. A team of 16 term positions and 21 permanent positions managed from headquarters and operating out of two field offices will conduct inspections of private and municipal fleets, perform new car dealership inspections, and utilize test vehicles to deter tampering and fuel switching in areas targeted for inspection/maintenance programs.

In 1980, the new mobile source in-use initiative calls for comprehensive enforcement of the antitampering and fuel switching provisions in selected nonattainment air quality control regions targeted for inspection/maintenance and support of the Denver Air initiative. Inspection and investigatory efforts will be coordinated nationally to focus on major private and municipal fleets, new car dealerships, commercial auto repair facilities, and service stations to maximize publicity and deterrent effect when violations are detected. Inspection/maintenance programs not only serve to improve emissions from noncomplying vehicles in use, but also will be used by the recall and SEA programs to identify classes of vehicles exceeding standards. This nucleus of 21 permanent and 16 term positions will be managed from headquarters in 1980, but will operate out of two field offices resulting in maximal enforcement effectiveness.

The Selective Enforcement Audit program is continued to deter the production of nonconforming light-duty vehicles, and implemented for heavy-duty engines to test the most suspect nonconforming configurations. The SEA program assures that new vehicles on the production line are in compliance with emission standards before introduced in commerce.

The recall program will continue to assure compliance of in-use vehicles with emission standards. SEA activity, recall testing, and increased public contract due to federally enforceable warranty provisions will serve to identify a greater number of vehicle classes suspected of exceeding emission standards in-use.

In 1980, activities of the fuels program will include conducting 25,000 combined unleaded and vapor recovery inspections at service stations and fleet dispensing facilities. These inspections will be performed under contracts with State and/or private testing firms. Because of recent data which indicate that substantial fuel switching is occurring, the fuels program will continue to emphasize reducing the improper use of leaded gasoline. The program will continue to monitor lead usage reports and the status of refiner efforts to achieve compliance with the lead phasedown program and administer the provision which prohibits the use of fuel and fuel additives.

The 1980 mobile source enforcement request is 138 positions and $6,,851,000. Approximately $3,355,300 of contract funds will be utilized in support of recall emission testing (including aftermarket parts), METFac, surveillance testing, antitampering, fuel switching, vapor recovery, inspection/maintenance, and fuels activities. In 1980, the mobile source enforcement program will continue to place primary emphasis on the implementation of programs aimed at reducing the failure of vehicles to meet emission standards.

During 1980, the major activities for the mobile source enforcement program will be to:

- Issue 42 SEA test orders.
- Conduct 5,000 fuel switching test vehicle inspections.
- Conduct 880 tampering test vehicle inspections.
- Conduct 1,200 new car dealership inspections.
- Conduct 30 warranty investigations.

- Conduct 5,000 fuels fleet inspections.
- Enforce unleaded gasoline and Stage I vapor recovery requirements through 25,000 combined fuels inspection tests.
- Conduct 15 inspection/investigations of auto manufacturers' certification and production activities.
- Conduct 40 recall investigations and 100 surveillance tests.
- Administer emission waivers.
- Conduct 1,400 tampering and fuels fleet inspections.

Water Quality

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Research and Development:					
Appropriation.....	$72,406	$56,898	$66,616	$63,659	-$2,957
Permanent Positions....	575	550	531	503	-28
Full-time Equivalency..	...	...	738	709	-29
Abatement and Control:					
Appropriation.....	214,106	243,223	237,755	239,545	+1,790
Permanent Positions....	1,923	1,891	1,796	1,774	-22
Full-time Equivalency..	...	...	2,200	2,164	-36
Enforcement:					
Appropriation.....	22,522	24,847	27,640	28,247	+607
Permanent Positions....	843	831	800	778	-22
Full-time Equivalency..	...	...	918	917	-1
Total, Water Quality Program:					
Appropriation.....	309,034	324,968	332,011	331,451	-560
Permanent Positions....	3,341	3,272	3,127	3,055	-72
Full-time Equivalency..	...	...	3,856	3,790	-66
Outlays.....	280,964	...	307,452	284,800	-22,652
Authorization Levels...	661,863	617,164	745,229	703,758	

NOTE: Construction Grants--See Page WQ-129

OVERVIEW AND STRATEGY

In passing the Clean Water Act of 1977, which served as "mid-course corrections" to the Federal Water Pollution Control Act of 1972 (P.L. 92-500), Congress reaffirmed the clean water goal established in 1972: "... to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The 1977 Clean Water Act preserves the basic structure of the 1972 Act, requiring uniform technology-based effluent limitations for control of industrial and municipal point sources of water pollution; Federal funding for construction of publicly owned treatment works; establishment of a national permit system for all point source dischargers as the means for enforcement; and funding for the State and local governments to develop plans and to formulate solutions for point and nonpoint source water pollution problems.

Although the objectives of P.L. 92-500 remain unchanged, the Clean Water Act of 1977 added significant new emphases to the national water quality program. The Act gives new emphasis to the control of toxic water pollutants from industrial sources through technology based effluent limitations. A large number of amendments to the Title II construction grants program created incentives for the use of environmentally justifiable, innovative and alternative technologies in municipal treatment systems; established funding for States to assist them in adopting and managing construction grants programs; made special considerations for the needs of small communities; and increases the emphasis on water reuse, recycling of usable pollutants, recovery of energy and confined disposal of polluted wastes to prevent their migration to the water. Tentative results from the 1978 Municipal Needs Survey indicates that the Federal share of the total municipal cost of meeting the 1983 best practicable waste treatment technology (BPWTT) standard is $69 billion. A long-term construction grants strategy, now being developed, will address these needs in the context of total Agency priorities.

The new Act also substantially changed the dredge and fill program providing for an increased role for EPA review of dredge and fill permits and the delegation of permit authority to the States.

In the process of implementing requirements set forth in the new Act, the Agency will concentrate in 1980 on improving the management and efficiency of its water programs. Particular emphasis will be placed on integrating activities conducted under the Safe Drinking Water Act, the Clean Water Act, and the Resource Conservation and Recovery Act. The major program areas that the Agency will pursue include the integration and consolidation of permit programs under the three statutes; coordination of construction grant planning with a comprehensive municipal enforcement strategy; the integration of State water quality, drinking water and solid waste programs through the newly initiated State-EPA Agreement process; and the closer coordination of research and development programs with operating program priorities.

Major program thrusts for 1980 - Although the Clean Water Act of 1977 forms the basis for the water quality program in 1979 and 1980, implementation will be characterized by the integration of these programs with the other water related efforts.

New emphasis on toxic pollutants - Beginning with the 1976 Settlement Agreement between EPA and the Natural Resources Defense Council (NRDC) et. al., the Agency has been and will continue to increase its program emphasis on the control of toxic water pollutant discharges. This emphasis was reaffirmed and expanded by the Clean Water Act of 1977.

In 1980 the emphasis on controlling toxic pollutants will emcompass and integrate every water program. Specific programs in 1980 which will have their primary focus on toxic pollutants include:

- Industrial effluent discharge limitations:

  By 1984, industrial sources of toxic pollutants will be required to meet technology based toxic effluent discharge limitations for both direct and indirect waste water discharges. This effort entails detailing the presence or absence of 65 toxic pollutants or classes of toxic pollutants in 21 major industries, through sampling, analysis and verification programs that are at the "state of the art." An in-depth economic analysis of each industry is also conducted to ensure that regulations are economically achievable and equitable. This program will peak in 1979 and 1980 and continue through 1981 with final promulgations and court defenses.

  The 1979 and 1980 program will also include additional pollutant studies (e.g. "hot spot" analyses) that will concentrate on selected areas of industrialization where monitoring data indicate high cancer incidence or potential water pollution problems would persist after the implementation of effluent limitations. The studies will lead to the development and implementation of additional controls. Efforts also will begin in 1979 and continue into 1980 to identify other toxic pollutants and industries that should be addressed in effluent guidelines.

- Water quality standards for toxic pollutants:

  The Agency in 1979, and peaking in 1980, is developing and will propose and promulgate water quality criteria for the 65 classes of toxic pollutants. These criteria will then be used by the States to form the basis for their ambient water quality standards.

- Hazardous Spills:

In 1979 and 1980, the Agency will implement and expand its spill prevention and response program to cover not only oil spills but also the discharge of those substances determined to be hazardous by EPA. The Agency is currently developing and will promulgate regulations for hazardous substances designations, removability, harmful quantities and rates of penalty. An environmental emergency response team has been established to provide immediate on-scene expertise in handling, clean up, and disposal of the most critical oil and hazardous substance spills.

- Municipal Discharges:

EPA will initiate an extensive study in 1979 on the potential for toxic pollutants being discharged from municipal treatment plants. Based upon the resultant data, EPA will determine what adjustments, if any, should be made in the Agency's pretreatment strategy, what impacts toxic pollutants are having on sludge disposal; and whether best practicable waste treatment technology (BPWTT) should be revised to include specific toxic pollutant limitations.

- Pretreatment:

Following the 1978 promulgation of Federal pretreatment guidelines, the program will begin to shift in 1979 and 1980 to the local level. Toxic pollutant controls will proceed by incorporating pretreatment requirements in municipal permits to control indirect discharges. Enforcement resources will be devoted to the pretreatment programs, consider requests for modification of pretreatment standards, and modify municipal permits to incorporate pretreatment requirements.

- Enforcement:

Toxic pollutant and hazardous materials enforcement will be pursued through enforcing reissued permits, bioassay inspections, pretreatment requirements, Section 404 requirements, and Section 311 hazardous substances requirements. In 1980, the permit program will initiate its issuance of permits derived from promulgated effluent guidelines for toxic pollutants.

In addition, in 1980 the permit program will work to consolidate National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act with hazardous waste permits under the Resource Conservation and Recovery Act and underground injection control permits under the Safe Drinking Water Act. Consolidation of these permit programs will eliminate duplicative permit issuance procedures, inconsistent permit conditions, and repetitious monitoring and reporting requirements for affected facilities.

- Research and development:

EPA's research and development activities are also shifting emphasis from conventional to toxic pollutants control. The 1980 program has three distinct categories: health and ecological effects, industrial research, and monitoring. Research and development activities have been specifically planned in 1980 to meet the immediate and projected needs of the Agency's toxic pollutant abatement and control and enforcement programs.

Health and ecological research is designed: (1) to determine the health and ecological effects of selected pollutants; (2) to determine the health and ecological risks of existing or emerging methods for treating or disposing of waste waters and associated sludges, including ocean discharge or disposal, land application, and renovation of waste waters for reuse; (3) to develop water quality criteria for protecting the integrity of fresh water and marine ecosystems, including associated wetlands; (4) to develop more efficient methods for assessing the toxicity of wastes; (5) to determine the movement, transformation, and fate of toxic pollutants in aquatic ecosystems, including the role of sediments in these processes and the rates and character of bioaccumulation in the food chain; and (6) to determine the effects of specific pollution sources such as dredging and associated activities and discharges from nonpoint sources.

Industrial research includes: (1) engineering analysis and special industrial problem solving in support of Agency toxic pollutant regulatory and permitting activities; (2) development of "best management practices" for industrial pollution not readily controlled by effluent limitations; (3) development of control technologies for spills; and (4) initiation of a major effort to demonstrate industrial recycle/reuse technologies.

The monitoring and technical support R&D program includes: (1) development of specific and broad spectrum methods for identifying and measuring pollutants in ambient waters, waste waters, sediments, and sludges, with current emphasis on toxic substances; (2) determination of reference methods for regulated pollutants; (3) provision of quality assurance services for Agency programs requiring collection and analysis of data on pollutants in ambient or waste waters; (4) development and evaluation of sampling and monitoring systems; (5) technical support to Agency spill and emergency response activities through aerial and remote sensing and data interpretation.

- Monitoring:

An important fundamental transition is taking place in EPA's monitoring program with the reorientation to toxic pollutants. Because of the complex analytical problems associated with monitoring toxic pollutants, EPA will be stressing quality assurance/quality control programs to ensure that EPA and State laboratories are taking samples, analyzing them, and storing the data properly. In 1980, a maximum priority will be placed on ensuring a minimum level of quality control for toxics monitoring efforts. These quality control efforts are critical to the new and expanded activities needed to provide adequate data for "hot spot" analyses, analysis of toxic pollutants in publicly owned treatment works, urban storm water run-off studies, and environmental exposure/risk determinations, as well as to support State/EPA agreements.

- Nonpoint sources:

Priority consideration will be given by the Agency to those nonpoint source controls which reduce toxic pollutant discharges. For example, a major program to evaluate the effects and control of urban storm water run-off is being initiated in mid-1979 and will continue well into 1980. Between 15-20 urban areas are being thoroughly evaluated through the use of State and areawide agencies and EPA resources.

Construction Grants Program

- Water program operations:

The keystone of the Agency's program remains the abatement of water pollution problems resulting from conventional pollutants, such as excess suspended solids, bacteria, and oxygen demanding loads that degradate our waterways. The problem of conventional pollutants is massive, and will still require a large commitment of personnel and dollar resources in the immediate future

Municipal point source control activities are addressed principally through the waste treatment facility construction program. The long-range goal of the construction grants program is to eliminate the municipal discharge of untreated or inadequately treated pollutants and thereby help restore or maintain the quality of the Nation's waters and protect the health and well-being of the people.

The program strategy for 1980 recognizes that there are limited funds available to meet these pollution control needs and that the funds available must go toward assisting municipalities in meeting the most critical needs in the shortest possible time. Accordingly, the EPA strategy for 1980-1981 is (a) to orient funding toward meeting the environmental requirements of the Act through stringent cost-effectiveness review on a project by project basis and (b) to stress innovative and alternative approaches to waste treatment, including emphasis on water and energy conservation, waste water reuse and recycling of pollutants, and small systems. Funds specifically earmarked for State delegation under Section 205(g) of the Act will be directed toward maximizing State assumption of program activities in the shortest possible time. In all cases, State delegation will be part of an overall agreement that will ensure that EPA policies and environmental objectives continue to be met.

EPA will continue to pursue program strategies that provide sufficient certainty and stability to States and municipalities to facilitate effective planning and management at all levels. The 1980 appropriation request of $3.8 billion is a critical component of this management need.

- Advanced treatment:

An amendment to the 1979 appropriation mandated that EPA closely review funding of advanced waste treatment or projects proposing treatment greater than secondary. EPA has developed and will implement a number of new procedures in 1979 to comply with this new requirement. The amendment requires detailed scrutiny of all advanced projects at several levels. The Appropriation Conference Committee directed that the Administrator personally review grant awards to all projects with incremental costs above secondary which are greater than $1 million. In addition, EPA will pursue a more rigorous review of all projects requiring treatment above secondary to ensure that State imposed limitations are properly applied and effective. During 1979, EPA expects to review approximately 600 projects greater than secondary, of which roughly one-third will be reviewed directly by the Administrator.

Pretreatment planning and advanced waste treatment planning are eligible for funding under both Sections 201 and 208. In previous years, these activities received Section 208 funding because they were accomplished on an areawide or water segment basis. Beginning in 1980, all pretreatment planning and advanced waste treatment planning related to facilities will be funded under, Sections 106 and 201, rather than Section 208.

- State delegation:

The State management assistance grant program authorizes the use of two percent or $400,000, whichever is greater, of each allotment to cover the cost of delegation of the construction grants program and (to the extent that funds suffice) the National Pollutant Discharge Elimination System (NPDES) permit, dredge and fill, and Section 208 management of programs to the States. EPA's long-term goal is to allow the States, rather than EPA, to assume responsibility for day-to-day management of construction grants activities. The timing and extent of delegation to each State depends on the State's ability to operate a program that meets the necessary competency requirements and policy direction mandated by the law and EPA objectives. A grant is given to a State when it can show that it is able to assume delegated responsibility for a substantial portion of construction grants program activities.

Approximately 26 States are expected to receive State management assistance grants during 1979, which will allow gradual phase-in of most program activities as the States staff up and are trained to accept each task. Most of the remaining interested States will have entered into preliminary negotiations during 1979, leading to a grant in 1980 and 1981. A total of 39 States are expected to have a grant by the end of 1980. Resource benefits from this State delegation strategy should begin to be evident in 1980 and 1981.

- Municipal enforcement:

Emphasis will continue in 1979 on the municipal enforcement strategy first formulated in 1978. As with other water quality programs, this strategy is an attempt to integrate program activities of the grants, enforcement, and NPDES permit compliance programs, to better coordinate and reinforce planning and scheduling of municipalities to meet the goals of the Act. The principal effort in 1979 will be to implement a program of action throughout EPA and the States, leading to:

- Integrated municipal permit and grants schedules;
- Compatible information systems;
- Internally consistent operating procedures; and
- Coordinated grant and enforcement sanctions for noncomplying municipalities.

The overall result is expected to be more effective and expeditious actions toward the municipal requirements established in the Act.

- Research and development:

Research to support the construction grants program is directed at the management of municipal or community sources of water pollution, including: (1) development of protocols for urban waste water effluent sampling to support the publicly owned treatment works (POTW) toxics study and development of technical alternatives for toxics control; (2) specific technical support for the innovative and alternative technology provisions of the construction grants program, including guidelines for and assistance in evaluating candidate technologies, including soil treatment; and (4) development and assessment of small flows systems; (5) evaluation of conservation, renovation, and reuse alternatives; (6) development and assessment of systems for managing wet weather discharges; and (7) optimization of existing treatment technologies for efficiency, reliability, and economy.

The Role of the States and Emphasis on Integrated Environmental Management - Through the passage of the Clean Water Act the Congress reaffirmed its intention that States have a major and continuing role in environmental programs. The year 1980 will mark the start of a new era in planning, implementing and managing environmental programs at the regional and State levels. State/EPA Agreements will present consolidated approaches to solving water supply, solid waste, and water pollution control problems. The integration of these program areas will be a major step toward the objective of global comprehensive environmental planning and management.

The process of integrated management is being initiated in 1979. EPA is requiring all States to develop comprehensive State/EPA Agreements to cover Clean Water Act programs, including consolidation of Sections 106, 208, 303, and the Clean Lakes provisions of Section 314.

State/EPA Agreements will be the result of a negotiation process between each State and its respective EPA region. The Agreements will describe activities that States and EPA will undertake during the coming year. An agreement will be the result of an assessment of what environmental problems face an individual State, development of a long-term strategy to solve those problems, and a determination of critical steps to take during the next year.

Each State/EPA Agreement will reflect important decisions on environmental and programmatic problems, State and EPA priorities, timing, and responsibilities. It also will be a management tool which focuses attention on the evaluation and accomplishment of major environmental efforts.

Initial Water Quality Management planning will be completed by all States and areawide agencies by the end of 1979. The continuing planning effort by local and State agencies in 1980 will focus on the highest priority problem areas with special emphasis on toxics. The Agency will stress implementation of the initial plans and require that substantial implementation is occurring as a condition for future funding. The key change in program management to assure Section 208 plans are being carried out is the development of the State/EPA Agreement process. State implementation will utilize funds provided under Section 106 program grants to accelerate establishment of regulatory programs and to provide for monitoring to assess the adequacy of clean up efforts.

Rural nonpoint source control will receive more attention with the goal of improving the Nation's agricultural water management practices. With the cooperation of the U.S. Department of Agriculture the Agency developed a program for promoting the utilization of effective nonpoint source control technologies by farmers and ranchers in seven pilot projects in 1978. That program will be expanded so more than 30 projects will be underway in 1980. These projects are directed at the most significant water quality problems caused by rural erosion, pesticides, fertilizer, and feedlot runoff. The long-range impact of completing these projects is the transfer of the program findings to other applicable problem areas across the Nation.

The rural clean water program will also be initiated in selected agricultural areas identified in approved water quality plans. This program provides cost share funds to farmers and ranchers for installing best management practices to prevent nonpoint source pollution. The criterion for project approval place highest emphasis on the severity of the problem and the demonstration of public benefits including effects on human health.

A national program effort to evaluate the effects and control of urban storm water runoff is being initiated in mid-1979 and will continue into 1980. The program will utilize 15-20 prototype projects to develop a technological base for assessing the runoff problem and developing control practices to provide Agency and national decision makers the information required to determine the significance of storm water runoff as a national problem. This 3-year project will analyze the impacts of runoff including toxics and air pollutant contributions and develop cost-effective solutions.

The quality of the Nation's ground waters is deteriorating. In 1980, the Agency will direct additional attention to ground water utilization and protection by initiating work in four to five areas in the Nation for use in establishing a more cohesive ground water policy and providing a better framework for Agency actions.

Protection of Wetlands Through the Dredge and Fill Program - The increased legislative attention to hydrologic modifications through Section 404 permits, parallels significant improvements in our understanding of aquatic resources, especially wetlands and shallow water areas. These are spawning and maturation areas for fish and shellfish species that constitute a substantial proportion of national fisheries resources. These systems also provide flood protection to downstream areas; protection of beaches, and other coastal lands; and water quality benefits through the absorption of nutrients and the uptake of some toxic pollutants.

Despite this background knowledge, there is a dramatically and continuously declining national inventory of such aquatic resources. Destruction of wetlands acreage, shallows, mudflats, streams, and even rivers through the drainage or filling of these areas for industrial, residential, or recreational use continues.

The burden of conserving our remaining resources falls on Section 404 of the Clean Water Act. Section 404 provides the principal protective tool and may underpin other non-Federal activities. EPA shares the responsibility for implementing Section 404 with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and, in the future, with the States.

Under the 1977 Act, the Corps will continue to allow dredge and fill material discharge in the traditionally navigable waters. States may assume permit responsibility in other waters if they are qualified. EPA's role in this process is large and includes responsibility for issuing regulations, establishing State program approval criteria, reviewing and acting upon applications from States, and providing continuing oversight for both States and the Corps permit programs. A significant increase in Section 404 responsibility for EPA will occur in 1980 as the Agency provides a responsible degree of substantive review on at least the most significant environmental permits, whether issued by the Corps or the States, and responds to the variety of new program development mandated by the Act. Underlying the resource needs to support these activities is a sense of urgency greater than and different from the problems of the control of industrial and municipal discharge; the destruction of a wetland or other aquatic areas through filling is irreversible.

SUMMARY OF INCREASES AND DECREASES	(in thousands of dollars)
1979 Water Quality Program.....	$332,011
Abatement and Control.....	+1,790
The net increase results from funding for the Corps of Engineers (+$6,800,000); effluent standards and guidelines (+$4,684,000); NEPA compliance-municipal waste facilities construction (+$1,869,000); manpower planning and training (+$614,000); and the clean lakes program (+$279,000). Decreases partially offsetting these increases are for control agency support (-$3,670,000); areawide waste treatment management grants (-$1,000,000); municipal waste treatment facility construction (-$2,541,000); dredge and fill (-$2,291,000); municipal waste treatment operation and maintenance (-$624,000); training grants (-$590,000); Chesapeake Bay program (-$500,000); State programs regulations and guidelines (-$424,000); ocean disposal (-$293,000); monitoring and data support (-$273,000); spill prevention and response (-$240,000); and a minor decrease in NEPA compliance/EIS preparation (-$10,000).	
Research and Development.....	-2,957
The net decrease of $2,957,000 results from a decrease in the Great Lakes program ($2,025,000), a decrease to the cold climate research program, the land application of waste water and sludge program, clean lakes project evaluations, and research on food chains (-$1,116,000); an increase to evaluate the potential health effects of reuse of waste water for industrial and aquacultural purposes (+$757,000); an increase to expand water quality predictive models (+$78,000), an increase in the Chesapeake Bay program (+$500,000); an increase for ocean outfall research (+$282,000); an increase to establish a major program directed at demonstrating the reuse and recycle options for industrial waste water discharges (+$4,237,000); a decrease resulting from a nonrecurring Congressional add-on in 1979 for potable reuse demonstration (-$8,000,000); a decrease in waste water control technology (-$135,000); an increase in urban toxics and residuals management	

(+$1,266,000); and an increase in monitoring and technical support activities (+$1,199,000).

Enforcement.....	+607

The increase is requested to implement the Agency's pretreatment program and other high priority permits and water enforcement activities.

1980 Water Quality Program.....	331,451

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An appropriation of $331,451,000 is requested for 1980. This request, by appropriation, is as follows:

Research and Development.....	$63,659,000
Abatement and Control.....	239,545,000
Enforcement.....	28,247,000

This request represents a net decrease of $560,000 from the 1979 level. The net change comes about primarily from decreases to Section 208 areawide waste treatment management grants; control agency support; municipal waste treatment facility construction; dredge and fill activities; Great Lakes program; and potable reuse demonstration. Offsetting these decreases are increases for the Corps of Engineers agreement; effluent standards and guidelines; NEPA compliance; demonstration of the reuse and recycle options for industrial waste water discharges; urban toxics and residuals management; and monitoring and technical support activities.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.....	$324,968
Congressional increases/decreases:	
Contractual services and monitoring and technical support.....	-1,521
Chesapeake Bay.....	+4,900
Great Lakes.....	+4,500
Saginaw and Pine Rivers studies.....	+275
Section 208, areawide waste treatment.....	-18,000
Academic training.....	+590
Dredge and fill activities.....	+2,500
Ocean outfall.....	+2,500
Corps of Engineers agreement.....	-3,000
Reduction in lapse rate.....	-330
Aquatic weed control.....	+600
Agricultural reuse.....	+8,000
Effect of October 1978 pay raise partial absorption.....	-546
Proposed October 1978 pay raise supplemental	+2,186
Distribution of October 1977 pay raise.....	+4,619
Transfer to Department of Labor.....	-502
Office of Research and Development reprogramming.....	-2,316
Headquarters and regional offices reprogramming.....	+2,588
Current 1979 estimate.....	332,011

Congressional changes to the water quality budget request resulted in the following: a $6 million reduction to the Research and Development contracts and monitoring and technical support resulted in a decrease of $1,521,000; add-ons totalling $15,265,000 were applied to the request for Chesapeake Bay ($4,900,000), for Great Lakes ($4,500,000), for an in-place toxic pollutant study for removal, treatment, and management of deposits of PCBs and PBBs in Saginaw and Pine River, Michican ($275,000), for academic training ($590,000), for dredge and fill activities ($2,500,000); for aquatic weed control research ($600,000), for reuse of waste waters for agricultural purposes ($8,000,000), and for ocean outfall contractual services ($2,500,000); a reduction of $18 million was applied to the Section 208 areawide waste treatment management program; $3 million was reduced from the Corps of Engineers agreement; and $330,000 was reduced from the Abatement and Control and Enforcement appropriations to implement the $3 million reduction in the lapse rate on filling positions.

Pay raise costs, including absorption of a portion of the costs, results in a net increase of $6,259,000. The agency request included all funds for the October 1977 pay raise in the management and support media, to be distributed by media at a later date. The increase reflected represents the share of this later distribution. The transfer of the contract compliance activities to the Department of Labor resulted in a decrease of $502,000.

Finally, agencywide reprogrammings result in a net increase of +$272,000, of which +$6 million is a "payback" from the air and radiation medias to the Section 208 areawide waste treatment management activity as approved by the Appropriations Subcommittee; -$2,316,000 is reprogrammed within the Office of Research and Development to the air media (-$1,223,000) and to the interdisciplinary media (-$1,093,000). Other reprogrammings are from the toxic substances media, +$873,000; from the solid waste media, +$244,000; from the drinking water media, +$121,000; to management and support activities, -$3,745,000; and -$905,000 to the air media.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations	$309,034	$370,852
Effect of congressional changes	+8,535	...
Effect of October 1978 pay raise	+1,640	...
Transfer to Department of Labor	-502	...
Effect of reprogrammings	+200	...
Program increases	+5,400	+6,300
Change in amount of carryover funds available	+5,499	-38,841
Change in rate of obligation	+41,046	-2,350
Total estimated obligations	370,852	335,961
(From new obligation authority)	(308,049)	(331,999)
(From prior year funds)	(62,803)	(23,962)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The congressional changes discussed in the previous section are expected to result in an increase of $8,535,000 to obligations. The effect of the October 1978 pay raise, as netted by absorption, will increase obligations by $1,640,000. The transfer of the contract compliance activities will reduce obligations by $502,000. The reprogrammings made by the Office of Research and Development and other headquarters and regional offices are expected to decrease obligations by $6 million.

The increase in budget authority over the 1978 level will result in an increase of $5.4 million in 1979 obligations; the program changes requested in 1980 are expected to increase obligations by $6.3 million.

The amount of carryover funds to be obligated in 1979 is $53,286,000, an increase of $5,499,000 over the 1978 level; in 1980, it is estimated that $14,445,000 of carryover funds will be obligated, a decrease of $38,841,000 from the 1979 level.

A change in the rate of obligation is expected in 1979, which would create an increase of $41,046,000 over the 1978 level. In 1980, the rate will decrease by $2,350,000.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
PROGRAM LEVELS					
State and Areawide Water Quality Management (208) plans approved.....	5	...	210	40	-170
State and Areawide Water Quality Management (208) continuation grants awarded...	169	...	200	198	-2
Clean Lakes Projects Awards.....	30	50	50	60	+10
Clean Lakes Projects completed..	4	...	10	20	+10
Ocean Dumping Permits.....	60	35	53	47	-6
Construction Grants Awards.....	2,275	6,400	3,200	3,400	+200
Step I Awards.....	(926)	(2,100)	(1,000)	(800)	(-200)
Step II Awards.....	(589)	(2,300)	(1,200)	(1,300)	(+100)
Step III Awards.....	(760)	(2,000)	(1,000)	(1,300)	(+300)
Active Construction Grants Projects.....	11,387	11,295	11,100	10,700	-400
State Program Approvals (National Pollutants Discharge Elimination System)...	32	33	35	37	+2
Adjudicatory Hearings Settled (Major Sources).....	246	342	237	60	-177
Permits issued by EPA:					
Municipal --					
Major.....	160	360	455	207	-248
Minor.....	300	...			
Nonmunicipal --					
Major.....	75	572	572	441	-131
Minor.....	1,326	...	...	...	...
Enforcement Actions (Administrative Orders, Notices of Violation, and Referrals to U.S. Attorneys).....	1,082	1,650	1,650	1,684	+34
Compliance Inspections.....	2,690	2,595	2,725	2,586	-139

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -	Page
			(dollars in thousands)			
Appropriation						
Health and Ecological Effects	$24,727	$21,001	$23,748	$22,224	-$1,524	WQ-14
Industrial Processes. . .	13,173	10,875	10,590	14,827	+ 4,237	WQ-32
Public Sector Activities.	20,761	12,740	21,227	14,358	- 6,869	WQ-42
Monitoring and Technical Support	13,745	12,282	11,051	12,250	+ 1,199	WQ-54
Total.	72,406	56,898	66,616	63,659	- 2,957	
Permanent Positions						
Health and Ecological Effects	266	228	218	204	- 14	
Industrial Processes. . .	71	62	60	57	- 3	
Public Sector Activities.	111	114	117	117	-	
Monitoring and Technical Support	127	146	136	125	- 11	
Total.	575	550	531	503	- 28	
Full-time Equivalency						
Health and Ecological Effects	...	...	324	288	- 36	
Industrial Processes. . .	...	...	82	86	+ 4	
Public Sector Activities.	...	...	151	156	+ 5	
Monitoring and Technical Support	...	...	181	179	- 2	
Total.	...	...	738	709	- 29	

Purpose

The role of research and development in EPA's water quality program is to provide the scientific information needed to support its standard setting and enforcement activities. To do this, a multifaceted research program has been established. The goals of this program include the development of efficient and cost effective wastewater treatment technology for both municipalities and industries; the determination of the health implications of existing technology for treatment and disposal of wastewater and sludge; the determination of useful and defensible monitoring methods; documentation of the validity of monitoring data; definition of criteria for water use in various aquatic environments; the establishment of strategies for control of pollution from spills of hazardous materials; and the prevention or control of pollution from agricultural and forestry sources. An overall goal is to provide the scientific basis for economical and socially viable environmental management.

Research and Development

Health and Ecological Effects

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Health Effects.	$3,538	$7,145	$6,316	$7,073	+$ 757
Transport and Fate of Pollutants	943	1,297	1,172	1,251	+ 79
Chesapeake Bay.	5,527	-	2,400	2,900	+ 500
Great Lakes	3,543	2,100	3,600	1,575	- 2,025
Marine Ecological Effects	4,367	3,427	3,111	3,393	+ 282
Freshwater Ecological Effects	6,809	7,032	7,149	6,032	- 1,117
Total.	24,727	21,001	23,748	22,224	- 1,524
Permanent Positions					
Health Effects.	19	26	23	23	...
Transport and Fate of Pollutants	9	7	4	5	+ 1
Chesapeake Bay.	-	-	5	5	...
Great Lakes	9	9	7	7	...
Marine Ecological Effects	80	57	49	45	- 4
Freshwater Ecological Effects	149	129	130	119	- 11
Total.	266	228	218	204	- 14
Full-time Equivalency					
Health Effects.	...	...	31	29	- 2
Transport and Fate of Pollutants	...	...	9	17	+ 8
Chesapeake Bay.	...	...	5	5	...
Great Lakes	...	...	14	9	- 5
Marine Ecological Effects			95	72	- 23
Freshwater Ecological Effects	...	...	170	156	- 14
Total.	...	...	324	288	- 36

Budget Request

The 1980 budget request for water quality health and ecological effects is $22,224,000 and 204 positions. This represents a net decrease of $1,524,000 and 14 positions from the 1979 level. This request provides for the following increases: $757,000 to evaluate the potential health effects of reuse of wastewater for industrial and aquacultural purposes; $789,000 and one position to expand water quality predictive models to include the highest priority classes of toxic pollutants involved in the Natural Resources Defense Council Consent Decree of 1976; $500,000 to increase the Chesapeake Bay Program; and $282,000 for ocean outfall related research. A four position decrease is also reflected in the marine ecological effects area. Decreases in the health and ecological area are: $2,025,000 in the Great Lakes Program and $1,117,000 and 11 positions in the freshwater ecological program.

The health effects research program includes the following areas:

- Determination of the health implication of existing and innovative technology for the treatment and disposal of wastewater and sludge.

- Development of rapid screening tests suitable for extrapolation to man for the characterization of toxic pollutants in complex effluents.

- Development of recreational water quality criteria.

- Determination of the feasibility of establishing criteria for the safe reuse of wastewater for potable, industrial and aquacultural purposes.

- Determination of the health effects of priority organic consent decree chemicals.

The health effects research program supports three national goals and policies set out in the Federal Water Pollution Control Act: to eliminate the discharge of pollutants; to attain water quality which provides for recreation; and to prohibit discharge of toxic pollutants in harmful amounts.

The research addressing health impacts of innovative technologies is focused on land application of wastewater and sludge. It includes studies on the health effects of aerosols from land application to help establish safe siting practices. This research supports the national goal of zero pollutant discharge, the Title II emphasis on innovative and alternative treatment, and the Section 405 guidelines on the disposal of sludge. Studies on potable industrial and aquacultural reuse similarly support the elimination of pollutant discharges and the preparation of guidelines for aquaculture (discussed in Section 318).

The remaining research is concerned with recreational exposures and other health effects of water pollutants. Recreational water quality studies are primarily concerned with microbial contaminants which may cause disease. In FY 1980, toxic organic contaminants become an important area of water quality health effects research. Health effects data bases for the regulation of identified priority pollutants will be established and methods for identifying currently unrecognized organic contaminants through biological screening will be developed.

The water quality transport and fate program is designed to provide information on, and methodologies for, assessing the movement, transformation, persistence, and ultimate fate of pollutants in fresh surface water. This program provides information on the interactions among various pollutants and natural constituents of water and soil. Such a technical base is essential for gaining an understanding of the water quality impacts resulting from given rates of release of various chemicals to the environment. With this type of information available, decisions can be made on the levels of control of specific chemicals required to achieve water quality goals in a cost effective manner.

The water quality transport and fate program covers two areas: the development of protocols, including mathematical models, for predicting point and nonpoint source pollution contributions and their impacts on fresh surface waters; and the development of procedures for systematically evaluating the effectiveness of alternative point and nonpoint source management strategies, with considerations of water quality, energy, and socio-economic impacts. These protocols and procedures are used by Federal, State, and local planning agencies. Other results of this research are used to: assess the adequacy of best available control technology and/or best management practices for meeting water quality goals at specific locations; translate ambient water quality goals into current and future control requirements--effluent limitations; identify the most cost effective combination of point and nonpoint source controls for achieving water quality goals at specific locations; and develop water quality management plans--as required under Sections 201, 208, and 303 of the FWPCA--for achieving and maintaining desired levels of water quality in the most cost effective manner.

which requires the EPA to conduct a study of the Bay, define the factors adversely impacting the environment, develop research to address adverse factors, and define management strategies to ameliorate degradation. The Region III Administrator was identified as the National Program Manager and has directed efforts to develop a program to address the mandate through a cooperative effort between citizen groups, state environmental agencies (Virginia and Maryland), and the EPA.

A program of integrated studies has been initiated to provide a predictive capacity to assess the consequences of pollutant loadings on the Chesapeake Bay in terms of effects on the ecosystem, on organisms, on human health, and on the economic impact of the uses made of the system. Capacity to predict these impacts will aid management decisions at all government levels. The three highest priority problem areas are considered to be toxic substances management, nutrient management to halt eutrophication processes, and management of the drainage basin ecosystem to control major ecological changes, such as the disappearance of submerged aquatic vegetation.

The role of the Great Lakes Research Program is to provide a scientific basis for assessing the source, fate, effects and the importance of chemical, physical and biological pollutants in the Great Lakes. An integral part of the program is to develop and improve predictive models of pollutants to aid management strategies and to protect and enhance water quality. This research supports the U.S. - Canadian International Agreement (1972) and EPA responsibilities under P.L. 95-200 and P.L. 99-321 (Clean Water Act).

EPA representation on the International Joint Commission assures that the research program continues to respond to Great Lakes research needs. Data obtained from this research program also supports information needs in the areas of water quality management and toxic effluents guideline development.

To accomplish this purpose a multifaceted research program has been developed. Its objectives are to characterize pollution problems of the Great Lakes, determine the dynamics processes affecting the pollution of large lakes, and develop predictive methods for describing the fate and effects of pollutants in the Great Lakes. Emphasis will be on the verification of phosphorus-phytoplankton models that have been used in load reduction simulations. New research will be on the fate of hazardous substances in the Great Lakes.

The marine ecological effects research program is designed to provide information on which to base legally defensible criteria, standards, and guidelines for effective pollution control programs and treatment strategies. This program includes research in the following areas:

- Determination of the effects of specific pollutants or pollutant combinations on representative or key sensitive organisms in aquatic ecosystems and on critical ecosystem parameters and processes.

- Investigation of the physical, chemical, and biological transformation products of pollutants in marine ecosystems.

- Development of mathematical ecosystem simulation and laboratory models to aid in the prediction of pollutant stress effects on aquatic biota and ecosystems.

- Development of methods to measure the relative "health" of aquatic ecosystems.

- Examination of the transport and effects of pollutants in marine environments.

In addition, the program provides technical assistance to EPA Regional and Program Offices through short-term studies, consultation and expert testimony in legal proceedings.

aquatic organisms. This includes research on the recovery rates, monitoring methods, and investigations of socio-economic factors.

The characteristics of the physical, chemical and biological transformation products of pollutants in freshwater ecosystems are studied to determine their impact and fate. Laboratory models and mathematical simulations are developed to aid in predicting pollutant stress effects on aquatic biota and ecosystems.

Some of the major areas of research include, 1) development and evaluation of test methods and protocols for aquatic toxicants and/or detection of mutagenic/carcinogenic alterations, 2) evaluation of the effects of complex effluents, 3) development of rapid screening methods to predict the bioaccumulation potential of organic chemicals in biota, 4) field validation studies and definition of new problem areas, 5) determination of best alternative waste treatment processes, 6) characterization and determination of the effects of non-point source (NPS) pollutants on water quality in rural and urban areas, 7) determination of the productivity and function of wetlands and pollutant impact within these systems, 8) evaluation of the ecological effects of land application of treated municipal wastes and 9) research on pollutant perturbations in cold climate ecosystems.

HEALTH EFFECTS

1978 Accomplishments

During FY 1978, resources totaled $3,538,000 and 19 positions of which $2,571,800 was expended on grants, $163,500 for contracts, and $7,000 for interagency agreements. Specific accomplishments included the following:

- An epidemiological study of adults and children living near 400 meters of a conventional wastewater treatment plant found that there were no increased risks of acute and chronic disease. This result indicates that present siting practices at this distance are acceptable from a health standpoint.

- Pathogens in aerosols from wastewater applied to land were identified and measured. Concentrations above background were found at 600 meters but not at 800 meters downwind. Viruses were found to be more hearty than the coliform bacteria. This research shows that coliform might not be the appropriate indicator organism.

- A model was developed to predict pathogen exposure from wastewater aerosols. The model provides information useful in the selection of land disposal sites. When minimum infectious dose information is available, actual risks of disease can be calculated.

- A method for quantifying concentrations of *Vibrio parahemolyticus* in marine waters was developed and validated. This pathogen is found in contaminated shellfish and bathing waters. It causes gastroenteritis and occasionally septicemia in exposed humans. The test is now being used in a study relating nutrient concentration to concentrations of *Vibrio parahemolyticus*. The study will contribute to the data base for setting appropriate recreational water quality standards.

- Identification and development of bioassay/screening methods for characterizing effluents with regard to health effects was begun.

The resources for health effects research in FY 1979 are $5,126,000 and 25 positions. Of this amount, $4,606,000 will be expended for grants, $520,000 for contracts, and $100,000 for interagency agreements. Highlights of the FY 1979 research program include:

- Continuation of studies on occurrence, movement and infectivity of pathogens in soil and food chains receiving wastewater or sludge.

- Initiation of minimum human infectious and pathogenic dose studies to determine the virus exposure required to affect human health.

- Continuation of studies of cadmium and other trace contaminants in wastewater and sludge to determine health impacts of various treatment and disposal methods.

- Completion of aerosol studies on conventional wastewater treatment facilities with a National symposium on aerosols to disseminate findings.

- Development and validation of such bioassay methods as rapid screening tests to characterize toxics in water.

- Establishment of a data base for final marine recreational water quality criteria.

- Establishment of a data base for interim fresh water recreational water quality criteria.

- Initiation of a coordinated research program to determine the feasibility of establishing criteria for the safe potable reuse of treated wastewater.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$829,200 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$50,000. A net increase of +$81,700 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of a intensive ZBB review of priorities and changing resource requirements for the FY 1979 operating plan -$860,900 was reprogrammed from this activity to health effects non-criteria pollutants within the air medium.

1980 Plan

The requested resources for health effects research in FY 1980 are $7,073,000 and 23 positions, an increase of $757,200 over 1979. Of this amount, $4,971,100 will be expended for grants, $677,900 for contracts, and $200,000 for interagency agreements.

The $757,200 increase over the present level will be used to evaluate the potential health effects of reuse of wastewater for industrial and aquacultural purposes and to increase the number of priority consent decree pollutants studied in FY 1980 from five to ten.

A major program thrust is to determine the health implications of existing and innovative technology for the treatment and disposal of wastewater and sludge, with pathogens and trace contaminants receiving special consideration. The program will focus upon: the health impact of utilizing sludge containing cadmium on food chain crops; the health risk of fungi associated with sludge composting operations; and the occurrence and transmission of parasites found in sludge. The data gathered on these and other issues will help EPA determine what constitutes safe treatment and disposal practices.

those conventionally used for assessing, threats to human health, this could result in a large savings of time and resources in the evaluation of health effects of environmental contaminants.

Another program component focuses on the derivation of interim freshwater recreational water quality criteria. Research on marine recreational water quality criteria will be completed in FY 1981. This research links epidemiology with good microbiological and chemical analyses of recreational water. Understanding the relationship of various water quality parameters to disease in swimmers and participants in other water sports will make it possible for EPA to decide which parameters, if any, should be controlled.

The research program on potable reuse of treated wastewaters will continue. This program will be coordinated with research on drinking water health effects and treatment. Advanced wastewater treatment effluents will be analyzed and toxicological assessments of key constituents will be made. Epidemiologic studies on populations where wastewater is used for ground water recharge will provide some human health data on indirect potable reuse. In FY 1980 the reuse program will be expanded to include aquaculture and industrial reuse. Screening tests and long term toxicological studies will be used to assess the impact of 10 priority consent decree pollutants on man via the aquatic food chain.

TRANSPORT AND FATE OF POLLUTANTS

1978 Accomplishments

The 1978 transport and fate budget totaled $943,000; extramural expenditures were divided as follows: grants, $295,700; and contracts, $132,900. During 1978 the program:

- Developed the first linked continous simulation model for stream-river-lake systems incorporating both point and non-point sources and in-stream transport and transformation of pollutants.

- Developed a computerized version of a general water quality basin planning methodology previously issued as a hand calculation technique.

- Completed an additional evaluation of the environmental, energy and economic consequences of alternative strategies for water pollution control, based on the Willamette River case history.

- Presented workshops, attended by planning and pollution control personnel, on techniques for estimating the magnitude of nonpoint source pollutant loads in streams.

- Completed development of a methodology (employing regression analysis of historical data) for estimating "natural" background levels of selected contaminants in fresh surface waters.

1979 Program

The 1979 resource level in the water quality transport and fate program area is $1,172,500 and four positions. These resources include approximately $480,000 in contracts and $425,500 in grants. The research in water quality transport and fate area is directed at:

- Completion of the development of the Section 208 areawide set of predictive models for the common pollution parameters and testing of the model set in two basins.

- Testing of the completed basin scale model set in two basins. This set is designed for conducting gross assessments of current and future point and nonpoint source induced water quality problems over relatively large areas--greater than 200 square miles.

- Initiation of expansion of the 208 areawide and basin scale sets of models to provide a capability to address selected consent decree toxic chemicals.

- Initiation of the development of a method for conducting environmental mass balances of consent decree toxic chemicals.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$124,500 results from several actions. A net increase of +$12,200 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of a ZBB review of priorities and changing resource requirements for FY 1979 operating plan -$136,700 was reprogrammed from this activity to health effects/transportation sources ($123,500) and health effects/non-criteria pollutants ($13,200) within the air quality medium.

1980 Plan

The 1980 plan calls for a resource level of $1,251,000 and five positions. This is an increase of $78,500 and one position over the present level to be used to increase efforts on water quality predictive models. Approximately $515,000 of the total will be expended for contracts and $455,000 for grants.

Research in the transport and fate program will be directed primarily at expansion of the first generation basin scale and 208 areawide model sets to include selected toxic chemicals covered by the 1976 Consent Decree. Expansion of the 208 areawide and hydrologic unit model sets to address sediments, alone and as a carrier of toxic chemicals, will also be undertaken. Limited testing of the completed model sets will be continued, utilizing applicable existing data collected by others.

CHESAPEAKE BAY

1978 Accomplishments

The resources for Cheasapeake Bay in 1978 were $5,527,200 of which $5,460,000 was spent on grants. During 1978 the program:

- Developed a program plan with and the states of Maryland, Virginia and Pennsylvania for studying the Chesapeake Bay and initiated major research efforts to investigate three of the Chesapeake Bay's environmental problems. Products of this research will be used by the regulatory authorities in planning and decision making processes and will be applicable to other estuarine systems.

- Initiated a $2.7 million dollar toxics management program to develop baseline information identifying and quantifying the distribution and concentration of toxic substances in the Chesapeake Bay.

- Investigated was the decline of submerged aquatic vegetation in the Bay. This involved a $2.3 million effort to define causes for the decline in aquatic grasses and to further understand their ecological significance within the Chesapeake Bay ecosystem.

NPS problems will be evaluated and recommended for further assessment and implementation.

1979 Program

The resources for Chesapeake Bay research in FY 1979 are $2,400,000 and 5 positions. Of this amount $2,275,000 will be expended for grants.

The FY 1979 Chesapeake Bay Program will continue its integrated approach in the areas of toxic management, submerged aquatic vegetation and eutrophication. This will include development of a predictive capacity to assess the effects of pollutant loadings to the system; development of a source assessment for toxic substances and nutrients entering the estuarine system from point and non-point sources; validation of transport and fate models for toxic substances in the system and evaluation of hazards to the ecosystem and to human health through the use of exposure effects models (process studies); and acquisition and synthesis of data to evaluate control options to halt eutrophication and major ecosystem changes such as disappearance of submerged aquatic vegetation.

In preparation for the initiation of a bay-wide system of monitoring stations, a sampling program will quantify atmospheric loadings of toxic substances and nutrients to the drainage basin and to the bay. Research will be coordinated, and information shared, with the Department of the Interior studies of the Potomac Estuary to record the ecosystem changes in response to modified pollution control strategies.

FY 1979 Explanation of Changes from Budget Estimates

The net increase of +$2,400,000 results from a congressional add-on of this amount.

FY 1980 Plan

Requested resources for the FY 1980 Chesapeake Bay Program are $2,900,000 and 5 positions. Approximately $2,400,000 of the total will be expended for grants. The $500,000 increase reflects an added emphasis on research in the areas of toxics, submerged aquatic vegetation and euthrophication.

The FY 1980 the program will continue the program of integrated study initiated in FY 78, so that management decisions at all the government levels can be based on a predictive capacity to assess the consequences of pollutant loadings on the Chesapeake Bay in terms of effects on the ecosystem, on organisms, on human health, and on the economic impact of the uses made of the system. The three highest priority problem area studies will be continued through ecosystem simulation, data acquisition and synthesis, and through identification and evaluation of control alternatives in conjunction with the abatement and control decision units of this program.

Toxic substances source assessment studies will be comprehensive analyses of the introduction of pollutants into the Chesapeake Bay Ecosystem from point and non-point sources. This information will be used to predict current and future loadings under a series of alternative development projections and management strategies. The transport and fate models developed bay-wide projections. These projections will be used in exposure effect models to evaluate the management strategies proposed to achieve environmental goals, standards, and criteria.

specific non-acceptable trends.

A study program with other agencies to evaluate the water quality problems induced by dredging and spill disposal and various hydrological modifications will be initiated. Management strategies to mitigate these problems and supplement the Department of Interior studies on the Potomac Estuary will be developed. These efforts are directed toward hydrologic and basic water quality models which will provide information to evaluate the impact of modified waste treatment strategies on this major tributary estuary.

GREAT LAKES

FY 78 Accomplishments

During 1978 the budget totaled $3,543,300 and nine positions. The extramural expenditures included $2,625,700 for grants and $156,200 for contracts. These funds were expended under the ecological process and effects program area. Major accomplishments included the following:

- Model simulations were provided to support the 1978 Great Lakes Water Quality Agreement which required that phosphorus loading be established for all of the Great Lakes. Eutrophication modeling efforts included estimation of phosphorus load reductions, point and diffuse, which would be required for maintenance of dissolved oxygen in Lake Erie, and to meet water quality objectives in Lakes Ontario and Huron.

- PCB atmospheric input estimates were completed for Lake Michigan. Atmospheric inputs are now recognized to account for approximately 50 percent of the lake loadings. PCB sampling has been sufficiently defined to determine the major transport pathways within a large lake system.

- Development of two hazardous substances models continued, and a mass balance of the inputs and major losses for PCBs and selected heavy metals was completed for Saginaw Bay. These models are a part of a series of hazardous substance models being developed both inhouse and extramurally.

- A two year study by the Philadelphia Academy of Science to investigate the possibility of biological control of the nuisance alge Cladophora was terminated. Testing indicated that Cladophora appears to inhibit the growth and reproduction of most of the test organisms. With this inhibitory action, a suitable biological control could not be found. This information will be made available to the operational programs for control strategy development.

- The analysis of planktonic diatoms from the open waters of Lake Michigan continued. The intent of this effort was to provide year round water samples, which would be analyzed for species of planktonic diatoms. An analysis of these samples will provide the first indication of separation between species related to the nearshore and open waters, and will provide the first complete data set on these two communities. These research results will be used to assess the impact of pollutants on near-shore phytoplankton community structure.

- Study to refine and verify existing eutrophication simulations and to formulate a quantitative methodology for analysis of sediment-water interactions in the Great Lakes continued. Experimental efforts in support of this activity were directed toward an understanding of the rates of adsorption and desorption of toxic organic molecules, settling rates, and sediment oxygen demand rates. This activity will support not only existing and new simulation efforts, but will be of considerable use to EPA and the Army Corps of Engineers in understanding the impacts of dredged material disposal.

the hazardous substances models and in dredged spoil criteria documents. A project was initiated in Lake Michigan to determine atmospheric loadings and ultimate deposition rates of selected trace metals. The metals being analyzed include zinc, cadmium, lead, copper, nickel, iron, cobalt, manganese, calcium and magnesium.

- Limnological investigations to support requirements of the Water Quality Agreement and to satisfy public interest in the water quality of Lake Erie continued. The results of the first studies indicate that the dissolved oxygen problems have not changed in the last few years. To detect the causes and to better understand the dissolved oxygen depletion, additional studies were undertaken in cooperation with NOAA and the Canada Centre for Inland Waters. These results will support the joint U.S.-CANADIAN Eutrophication control effort.

- Fish larval surveys were conducted to accurately assess the impact of fish larval entrainment and fish impingement by an electric power plant. The results indicate that the impact of the entrainment and impingement on the adult yellow perch population is of sufficient magnitude for the State of Michigan, together with the power company, to investigate alternatives to lessen the impact.

1979 Program

The resources for Great Lakes Research in 1979 are $3,600,000 and seven positions. Of this amount, $2,224,000 will be spent for grants and $430,000 for contracts.

Highlights of the 1979 program include:

- Eutrophication and algal enrichment: The Lake Michigan phytoplankton model will be completed. (This completes the general eutrophication modeling.) Models are applicable for all the Great Lakes except Superior where a phytoplankton model is not required at this time. As nutrient input reductions occur, field data will be collected to verify the model simulations made prior to the reductions. Field and laboratory studies during 1978 indicated the feasibility of developing a growth model for *Cladophora* (a near shore nuisance alga in lakes or reservoirs.) Field studies will proceed during the next two years to provide data on *Cladophora* growth in response to various types of nutrient input and for the development of a predictive model which will be used to formulate a management program.

- Power production and related fish loss: Utilizing data collected in previous years, effects of power production on the fish populations in the Central basin of Lake Erie will be assessed.

- Dredged spoil disposal: Research on dredge spoil disposal will be emphasized, increasing our predictive capability for long term pollutant losses from disposal sites. Research gaps which now prevent the development of a dredged disposal criteria document, will be identified.

- Hazardous substances: The greatest increase in research effort is in the area of organic pollutants and their pathways to and effects on man. Studies to better define hazardous substances in the route and effects of organic pollutants will continue. Studies on fish consumption and human blood levels and their effects will provide the necessary data to link sources and man. It is expected that this research will not only provide a basis for exposure levels, but also, estimates on the persistence of the problem.

FY 1980 Plan

Requested resources for the FY 1980 Great Lakes program are $1,575,000 and seven positions including approximately $980,000 for grants and $186,000 for Contracts. This is a decrease of $2,025,000 from 1979. The program will continue along the lines established in FY 1979

The research program will emphasize:

- Eutrophication: The Cladophora growth model will continue to be developed and verified for use in management programs. Phytoplankton models will be updated. Studies on the dispersion and fate of contaminants in a stratified lake with emphasis on the deoxygenation in the hypolimnion will be continued.

- Hazardous Substances: The ecosystem research effort to establish the pathways, reservoirs and effects on humans of persistant organic pollutants and hazardous substances including those in suspended materials and sediments will continue. The studies on fish comsumption and human blood levels and effects of selected trace pollutants will continue to establish a basis for exposure levels and estimate the persistence of selected toxic chemical pollutants. Research will be conducted on the effects of polychlorinated Biphenyls on Great Lakes phytoplankton community. Bioaccumulation, partitioning of PCBs into the lipid phase and the interference of this partitioning growth and nutrient uptake kinetics will be evaluated. The modelling of toxic substances in the Great Lakes food chains will continue. A compartment model of the principal features of the ecosystem will permit calculation of the transport of hazardous substances throughout each compartment. Studies on atmospheric loadings of toxic materials will be expanded to cover the entire Great Lakes Basin.

MARINE ECOLOGICAL EFFECTS

1978 Accomplishments

In FY 1978, the program had $4,366,700 and 80 positions. Of this total, $807,500 was for grants, $388,600 for contracts and $121,600 for interagency agreements. Major accomplishments included:

- Completion of a study defining wetland boundaries for coastal marshes along the Pacific Coast and development of a field bioassay method for evaluating uptake of metals by marsh plants. These studies will be useful in defining wetland boundaries for permit decisions involving disposal of dredge material and evaluating the effects of metals on wetland productivity.

- Review of relevant scientific data relating to cooling systems and development of recommendations concerning the Seabrook Power Plant controversy.

- Development of an approach to conduct environmental impact assessments for proposed power plants employing open once-through cooling.

- Publication of a user's manual for determining chemical equilibrium to be used by Regional Offices in determining pollution potential of chemicals in aquatic systems.

- Development of a technique for the rapid analysis of trace elements in selected small marine organisms.

evaluating the utility of this system as a rapid toxicity testing tool.

- Publication of guidelines for sampling and analyzing the marine macrobenthos; zooplankton and phytoplankton sampling; use of small trawlers in coastal surveys; and use of numerical classification in ecological investigations. These guidelines will be useful in developing baseline and monitoring programs; permit decisions on where to dump wastes or locate ocean outfalls; and evaluating the impact of a pollutant, or pollution event, and/or the recovery rate an area after such an event.

- Completion of studies on the "in situ" biology of a dominant benthic deposit feeder (Nephtya Incisor) and the development of an "in situ" laboratory study system. The new techniques and information will be utilized to observe pollutant stress responses in benthic bioassays.

- Publication of a user's guide for a transient water quality network model for physical transport and nitrogen cycling in rivers and estuaries. This model can be used in predischarge evaluations to determine waste load allocations and in the prediction of effects such as phytoplankton blooms.

- Publication of a report on circulation features of deep inlet coastal environments, such as fjords, and their influence on primary productivity. This information is also useful in predischarge evaluations and the prediction of phytoplankton blooms.

- Completion of histophathologic examination of oysters, limpets, cockels and razor clams collected from the AMOCO CADIZ oil spill site showed an increase in mucous secretory cell activity and hyaline degeneration of muscle bundles and connective tissue. The same findings were noted in mussels, mullet, flounder and coral exposed to oils in the laboratory.

- Confirmation of laboratory studies showing inhibition of reproduction in macroalgae exposed to oil through observations of the AMOCO CADIZ oil spill.

FY 79 Program

The resources for marine ecological effects research in FY 79 are $3,111,100 and 49 positions. Of this amount $784,000 will be expended for grants, $60,000 for contracts, and $115,000 for interagency agreements.

The FY 1979 program will continue to support information needs in the areas of water quality criteria development and evaluation of effects from ocean outfalls, ocean dumping material and dredged spoil disposal on wetlands. A new emphasis will be placed on research relating to ocean outfalls. Other areas of study include research on the effects of biocides/ antifoulants, chronic exposure to sublethal levels of oil and long term exposure to low levels of increased temperature.

Highlights of the FY 79 program include:

- Research on: water quality criteria development which emphasizes development and application of methods (biomathematical, behavioral and physiological indices) for quantitative assessment of effects on marine communities; the development and application of marine assays for detection and assessment of genetic toxicants; development of techniques to measure trace elements in water, sediment and organisms; studies of nutritional requirements of marine fishes; and the development of chronic/life cycle and in situ bioassay methods. (This research is in response to Section 304 of the Clean Water Act, as amended, which requires the publication and updating of water quality criteria to reflect the latest scientific knowledge. Based on the criteria, water quality standards are set by the States and EPA).

ocean outfall; the optimum type of treatment for ocean outfalls for municipal wastes, based on the impact of various levels of sewage treatment; the size and configuration of mixing zones; the effects of chromium and nutrient pollutants on phytoplankton populations; the response of a tropical estuary to relaxation of sewage stress (measuring the extent and rate of recovery) and the applicability of a chemical equilibrium model. (In addition, two special studies are mandated by the Clean Water Act of 1977 are being conducted. These are the effects of the discharge of raw wastewater from rum distilleries; and the impact of the disposal of seafood processing wastes, with emphasis on benthic macrofaunal response and sediment quality. Information gained from this research will be used to evaluate effluent limitations, establish ocean discharge guidelines, evaluate National Pollutant Discharge Elimination System (NPDES) permits, and in particular to evaluate waivers from the secondary treatment requirement for ocean outfalls (301h.)

- Studies on ocean dumping which include the development and validation of various types of benthic bioassays for both solid phase and liquid phase materials and determination of those biological indices which are most useful in quantitative impact assessment. Ocean dumping research is conducted to provide information and methodologies for use in both the ocean dumping permit program and for the dredge material disposal program. Although current research has its emphasis on dredge material disposal, research in other areas are related to ocean dumping (e.g., bioassay development). (It should be noted that the dredged material research is coordinated through a joint technical committee with the U.S. Army Corps of Engineers.)

- Research on: impact of dredged material on wetlands. This research is related to the dredged material disposal permit program and to area wide planning requirements. Wetlands research is focused on wetlands boundary definition and productivity and function studies. This research is important in the determination of what constitutes a wetland is and which wetlands are most productive or functionally important, and therefore must be protected.

FY 79 Explanation of Changes from Budget Estimate

The net decrease of -$315,900 results from two actions. A net increase of +$187,900 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Secondly, as a result of the agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$503,800 was reprogrammed from this activity to health effects/non-criteria pollutants ($225,600) within the air quality medium and to scientific assessment ($278,200) within the interdisciplinary medium.

FY 1980 Plan

Resources for the FY 1980 marine ecological effects program are $3,393,000 and 45 positions. Approximately $950,000 of the total will be expended for grants, $125,000 for contracts, and $150,000 for interagency agreements. The $282,000 increase will support research relative to the discharge of waste materials via outfalls, the development criteria for such waste disposal practices and the field evaluation of modified practices. Emphasis will be given to the determination of the ecological effects of ocean disposed wastes which have undergone various levels of treatment. This research will permit a comparison of effects under different environmental conditions and will be useful in the reevaluation of ocean outfall secondary treatment waivers. The decrease of 4 positions will reduce the in-house activities associated with the research program on urban stormwater run-off and the development of criteria for toxics and other pollutants in sediments.

used in the ocean dumping and dredge material disposal permit program.

The development, or refinement, of marine analytical techniques will be continued. Emphasis will be given to those techniques which measure trace elements in sediments and organisms. The aquatic organism culture research program will, in addition to providing experimental stock for other areas of research, conduct research on the nutritional requirements of marine organisms and develop culture methodology for rearing and holding experimental organisms.

Continuing efforts in the area of ocean outfalls will emphasize the municipaal discharge research, although some research will be conducted on industrial discharges. This research will determine the response of marine organisms and ecosystems to physical factors influencing pollutant transport and retention: the dispersal and accumulation of wastes discharged from ocean outfalls; the size and configuration of mixing zones; the effects of ocean discharges; the response of an estuary to the relaxation of sewage stress; and the optimum type of treatment for ocean outfalls for municipal wastes, based on the impact of various levels of sewage treatment.

Ocean dumping research will continue to focus on problems relating to the disposal of dredged materials. This research will be coordinated with the U.S. Army Corps of Engineers through a joint technical committee on criteria for dredged and fill material. Emphasis will be given to the validation of benthic bioassay procedures, studies of pollutant availability from dump sites, and development of biological indices for use in impact assessments. It should be noted that bioassay research is also related to this problem area. Information and methodologies from this research will be used in both the ocean dumping permit program and the dredge material disposal program.

Wetlands research will be shifted away from boundary definition work, and more emphasis will be given to studies which will address questions of productivity and function. Information useful in determining which wetlands are the most productive or functionally important will be used in the dredge material disposal permit program and for area-wide planning. This research will be closely coordinated with the freshwater wetlands research.

FRESHWATER ECOLOGICAL EFFECTS

FY 1978 Accomplishments

In FY 1978, total resources were $6,808,600 and 149 positions which included $1,072,600 for grants, $397,800 for contracts, and $162,100 for interagency agreements.

The major accomplishments and areas of emphasis were as follows:

- Development of a lake restoration workshop in cooperation with the Water Resources Research Institute at Oregon State University. This workshop was part of an on-going effort to rapidly transfer research findings to local agencies for use in their lake projects.

- Publication of "A Research Strategy for Social Assessment of Lake Restoration Program." This report will assure local agencies information about the cost/benefits of their proposed and on-going lake restoration projects for use in decision making.

- Completion of a study demonstrating acidification of lakes in the Boundary Waters Canoe Area of Minnesota and the present and potential significant adverse effects of atmospherically-induced change.

- Publication of results defining the relationship between the ionic form of copper and resulting toxicity to aquatic organisms. These results will be used for revising criteria for total and ionic copper.

- Publication of two reports which linked pollutant-induced stress to outbreaks of viral diseases in salmonid fishes. This information will aid in preparing water quality criteria and standards.

- Determination of the maximum concentrations of 28 organic and 6 inorganic chemical pollutants which affect aquatic species.

- Initiation of a study to confirm existing temperature and dissolved oxygen criteria for fish in the presence of a toxic pollutant. These results will allow preparation of standards for toxic substances.

- Completion of studies describing the effects on fish of lowered, constant and fluctuating concentrations of dissolved oxygen. These research results will be used for standards development.

- Development of a new apparatus for conducting short-term tests using sensitive embryo and larval stages of fish in the laboratory and at field sites. This will be used for screening individual toxicants and complex effluents.

- Completion of studies and development of a procedure for predicting the bioaccumulation potential of organic chemicals in aquatic organisms; the technique uses estimates of the lipid/water partition coefficient obtained by high pressure, liquid chromatography methods which were developed for this purpose.

- Completion of studies of chemical residues in fish. Results suggest that the ratio of naturally occurring hydrocarbon (N-Heptadecane) to petroleum hydrocarbons in fish tissue may be a sensitive and inexpensive indicator of oil pollution.

- Further development of a method to predict the toxicity of classes of chemical compounds based on the relationship of the chemical structure of the compounds to their biological activity. This method was confirmed for 12 phenol compounds. The information will be used as part of recommended toxics testing protocols required by regulations.

- Development of a method for relating the degree of stream bed sedimentation to the reproductive success of salmon and trout. These results will be used in criteria development and non-point source predictive modeling.

- Identification of fifty-seven non-PCB polychlorinated chemicals in fish tissue from nation wide samples. These results show wide geographical use of these toxic materials and their non-localized distribution in the surface waters and biota of the U.S.

- Participation in the 4th US/Japan meeting on the management of bottom sediments containing toxic substances and publication of proceedings. This activity was part of a continuing effort to give national and international visibility to this program.

- Completion of a study on Bromo-organic compounds. Results indicate that these compounds bioaccumulate in fish. This raises a question about suitability of chlorbromination as an alternative to chlorination for disinfection of municipal wastes.

- Completion of a study of fine particles occurring in freshwater systems. Results demonstrate that ingested asbestos fibers penetrate the gut wall of humans and are excreted in the urine. The study resulted in substantially improved methods for counting asbestos fibers.

FY 1979 Program

The resources for freshwater ecological effects research in FY 1979 are $7,148,800 and 130 positions. This includes $713,000 for grants, $308,000 for contracts, and $70,000 for interagency agreements.

Overall, the research program focuses upon development of scientific information in support of water quality criteria. These criteria are necessary to determine both the need for, and application of the control technology in abating pollution in freshwater ecosystems. In particular, the program addresses methods development in enviromental toxicology, including bioassays and chemical structure analysis, validation of these methods, characterization of pollutants, and the identification of effects from pollutants, singularly and in combination, on stressed and non stressed biological systems.

Methods development work, with emphasis on defining early indications of chronic effects, improving reliability and reducing costs, includes:

- Development of toxicology methods to predict the mode of action and rapid screening tests for chronic effects for aquatic organisms. Indentification of key physiological processes and effects for use as early warning predictors of chronic effects.

- Development of new techniques for predicting toxicity through use of chemical structure.

- Evaluate effectiveness of municipal and industrial waste treatment techniques on biological components of ecosystem, especially those receiving BMT or BAT and which are suspected to contain chemical contaminants.

- Development of methods to assess the impact of non-point source pollutants, such as suspended sediments and toxic chemicals, on the ability of both warm and coldwater streams to sustain an acceptable biological community.

- Determination of validity of laboratory tests to predict the effects of pollutants in natural systems.

- Development of methods to improve predictive capabilities for restoring degraded lakes.

The characterization aspect of the program focuses upon:

- Determination of the dispersal of hazardous fine particles, such as asbestos, in the environment.

The effects work includes:

- Initiation of studies to determine the effect of pollutant - induced stress on susceptibility of salmonid fishes to bacterial and viral diseases.

- Analysis of effects of intermittent exposure of freshwater biota to toxic chemicals.

FY 1979 Explanation of Changes from Budget Estimates

The net increase of +$116,800 results from several actions. Congress provided an add-on of +$600,000 for acquatic weed control research. An increase of +$212,800 resulting from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise is offset by the transfer of -$600,000 to other agency activities to partially absorb the costs of the most recent pay increase. In addition, Congress applied a $6 million reduction for contractual services and monitoring and technical support activities; -$25,000 of this amount is applicable to this activity. Finally, as a result of ZBB review of priorities and changing resource requirements for the FY 1979 operating plan -$71,000 was reprogrammed from this activity to scientific assessment within the interdisciplinary medium.

FY 1980 Plan

The requested resources for freshwater effects research for FY 1980 are $6,032,000 and 119 positions. Of this total $100,000 will be expended for grants, $30,000 for contracts and $20,000 for interagency agreements. The decrease of $1,116,800 and 11 positions eliminates the entire research effort on cold climate environmental problems and reduces evaluations of cost effectiveness of the Clean Lakes demonstration projects and work on ecological studies of land application of wastewater and sludges will also be reduced.

Our program will concentrate upon environmental exposure work, which includes effects and human food chain analyses, methods development in environmental toxicology (including bioassays and chemical structure analyses), and characterization of pollutants. The research program also plans to identify and fill in research gaps in the analyses of the 129 Consent Decree chemicals to support preparation of Water Quality Criteria documents.

The work on environmental exposure includes:

- Indentification of the passage of select toxic chemicals through the food chain and the effect to man with emphasis on identifying those pathways by which man's exposure to pollutants is increased.

- Analysis of the transfer of toxic pollutants through wetland food chains.

- Evaluation of exposure risks to man from certain toxic pollutants accumulated in food chain.

The methods development work will focus upon:

- Development of methods for predicting effects of reduced nutrient loading to lakes with emphasis on the verification of methods developed and identification of costs associated with various restoration techniques.

- Development of methods to assess impact of non-point source pollutants, such as suspended sediments, on stream systems. Assess the effectiveness of BMP on protecting and/or enhancing stream quality.

composition and concentration over time.

- Determination of the usefulness of aquatic organisms as biological models for predicting human effects.

- Determination of the utility of chemical structure activity correlations for indicating potential toxicity for classes of pollutants.

The characterization effort focuses upon hazardous fine particulates. In particular, we will develop procedures for identifying the properties of small particles, (such as asbestos fibers) which govern their biological activity with emphasis on fate of ingested mineral fibers in the human body. All research will use naturally exposed populations such as those using Lake Superior water.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Industrial Processes . . .	$ 8,956	$ 7,400	$ 7,451	$11,700	+$4,249
Renewable Resources. . . .	4,217	3,475	3,139	3,127	- 12
Total	13,173	10,875	10,590	14,827	+ 4,237
Permanent Positions					
Industrial Processes . . .	35	33	33	29	- 4
Renewable Resources. . . .	36	29	27	28	+1
Total	71	62	60	57	-3
Full-time Equivalency					
Industrial Processes . . .	N/A	N/A	42	48	+6
Renewable Resources. . . .	N/A	N/A	40	38	-2
Total	N/A	N/A	82	86	+4

Budget Request

The 1980 budget request for Water Quality Industrial Processes is $14,827,000 and 57 positions. This represents an increase of $4,248,700 in industrial processes and a decrease of $12,200 in the renewable resources area. The increase will be used to establish a major program directed at demonstrating the reuse and recycle options for industrial wastewater discharges, as well as providing evaluations and solutions for the reduction of intermedia impacts from pollution abatement practices. A four position reduction in industrial processes and one position increase in renewable resources are also requested.

Program Description

The industrial processes water quality research program deals with point and nonpoint sources of pollution resulting from the industrial, agricultural, and forestry sectors of the economy. This program develops and demonstrates new or improved cost effective technology.

The industrial processes portion of the research program concentrates on point sources of water pollution, resulting from the industrial sector of the economy in those mining, manufacturing, service, and trade industries which must meet best available technology (BAT) standards of the Federal Water Pollution Control Act (FWPCA). This program is the realization of the national policy established in the 1972 Amendments, which called for a major research and demonstration effort to develop the technology necessary to help eliminate the discharge of pollutants into the Nation's waters.

This program thus develops new or improved technology having industry-wide application, short term achievability, and long term viability. Research results also provide a significant data base for the establishment of economically and technically feasible effluent guidelines and treatment parameters for industrial liquid waste discharge permits. As a result of the Natural Resources Defense Council Consent Decree in June 1976, program emphasis has been shifted toward the development of the data

pollutant-materials in industrial waste effluents. High priority is put on the development and demonstration of reuse and recycle options for industrial wastewater discharges. In addition, this program addresses technology for the prevention and control of spills of hazardous materials, in support of Section 311 of the FWPCA.

The renewable resources research program conducts research related to the control of environmental pollution associated with agricultural and forestry activities, including crop production on both irrigated and nonirrigated lands, forest management practices, and animal production. This research program is integrated with those of the Departments of Agriculture and Interior, and state universities and land grant colleges. The program encompasses the evaluation and development of total management systems including best management practices (BMPs) and pollution control predictive methodologies to control water, land, and air pollution from the production and harvesting of food and fiber and from their related residual wastes; and, to a lesser extent, the assessment of probable trends in the production of renewable resources and their resulting environmental and socioeconomic impacts.

The renewable resources research effort also supports the development of guidelines to identify and evaluate the nature and extent of agricultural and forestry nonpoint sources of pollution, along with the necessary processes, procedures, and methods to control pollution from these sources (as required in Section 304 (f) of the Federal Water Pollution Control Act Amendments of 1977, PL 95-217). It is also responsive to the requirement of Section 208 of the FWPCA to support assessment and management of pollutants emanating from nonpoint sources, as required of State and local agencies in the execution of their areawide waste management responsibilities. In addition, Section 208(j) provides for the Rural Clean Water Program, and makes available cost-sharing grants to agricultural producers for the installation of best management practices to improve water quality. This section places an added urgency on the need for development of methods to select and evaluate cost-effective management systems in order to ensure the effective expenditure of limited Federal resources. As a result of mounting pressure for increased production of renewable resources, efforts must be initiated to better understand the potential environmental impacts of alternative approaches to increased production in order to maintain desirable levels of environmental quality.

In order to develop a basis for selecting and justifying local management techniques for controlling nonpoint source pollutants related to agricultural and forestry production, it will be necessary to (1) develop methodologies to estimate or determine background levels of pollution in agricultural and forestry production regions; (2) provide tools for the planner/decision maker to determine the probable environmental consequences of the major agricultural and forestry pollutants, including appropriate predictive methods; (3) provide tools to select and evaluate both the pollution reduction and cost effectiveness of individual and combined management systems; (4) develop cost effective methods that minimize agricultural and forestry pollution by evaluating and demonstrating different systems at different locations; and (5) develop, evaluate, and demonstrate implementation strategies, including socioeconomic and institutional aspects for candidate best management practices.

INDUSTRIAL PROCESSES

1978 Accomplishments

The FY 1978 resource level for this activity was $8,955,900 and 35 positions which included $4,811,000 for contracts, $2,153,000 for cost sharing research and demonstration grants, and $457,000 for interagency agreements.

- Evaluated two technologies for treating bleach plant effluent from three different types of wood pulp mills.

- Demonstrated the use of a rotating biological contactor on raw wastewater from a liquid detergent manufacturing plant.

- Developed and demonstrated a spill alert device for impounded hazardous materials.

- Demonstrated countercurrent rinsing on a high speed halogen tin plating line to reduce blowdown.

- Designed and constructed a mobile wastewater treatment system for evaluation of new wastewater treatment technologies at coke plants.

- Completed carbon and biotreatability studies on pesticide manufacturing wastewaters.

- Developed a new method of regenerating activated carbon using solvent regeneration with supercritical fluids.

- Evaluated technologies for control of pollutants in wastewater from organic chemical and related industries: adhesives and sealants, truck washing terminals, industrial laundering and synthetic rubber manufacture.

- Identified the conventional treatment technologies capable of removing priority pollutants from organic chemical and related industry's wastewaters.

- Demonstrated the use of resin adsorption technology to the treatment of Endrin and Heptachlor manufacturing wastewaters.

- Demonstrated on a pilot scale the use of hyper-filtration to remove toxic pollutants from textile wastewaters.

- Completed field testing of existing control technologies for treatment of textile wastewaters.

- Determined the degree of susceptibility of refractory organics to municipal waste treatment systems.

- Assessed petroleum refinery effluents for the presence of toxic pollutants.

1979 Program

In 1979, $7,451,300 and 33 positions have been allocated to this program, of which approximately $3,973,000 will be expended on contracts, $1,005,400 for grants, and $126,500 for interagency agreements.

In FY 1979, activities will be focused on the research, development, and demonstration of control and treatment technologies. These technologies are aimed at reducing hazardous and toxic pollutant effluents from industrial point sources to acceptable levels. Previously completed source assessments will serve as a basis for determining areas of investigation. Outputs will be used to validate and support technically feasible effluent guidelines.

Major research results to be achieved in FY 1979 include:

- Demonstration of technology for the abatement of hazardous and toxic effluents from the organic nitrogen chemical industry.

- Demonstration of ultraviolet ozonation for high priority organic chemical waste streams.

- Demonstration of control of toxic discharges from tailings ponds, hot and cold forming, and rolling steel mills.

- Demonstration of the control of discharges of chlorinated hydrocarbons.

- Demonstration of technology for the removal of emulsified oily wastes from the metal finishing and fabrication industry.

- Evaluation of options for tracing the plumes of spilled hazardous materials in water and computerizing spill response data.

- Determination of alternative means for removing hazardous materials from large rivers.

- Continuation of assessment of newly emerging technologies in controlling discharge of toxic pollutants.

- Demonstration of the control of discharges of toxic, chlorinated phenolic compounds from bleach plants, wood preserving and pulp mills.

- Demonstration of organic waste recovery by activated carbon and steam stripping in pulp industry.

- Determination of wastewater recycle and reuse practices for 22 industries, with emphasis on the 11 identified as priority industries by the Effluent Guidelines Division. The output of this study will be used for the 1980 evaluation of recycle/reuse technologies.

1979 Explanation of Changes from Budget Estimate

The net increase of +$51,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

1980 Plan

The requested FY 1980 resource level for this program is $11,700,000 and 29 positions, an increase of $4,248,000 and a decrease of 4 positions. These resources include approximately $7,900,000 for contract support, $1,300,000 for grants, and $15,000 for interagency agreements.

In FY 1980, activities will continue to concentrate on the research, development, and demonstration of control and treatment technologies. Currently available treatment methods will be optimized and innovative technologies will be developed to reduce the level of, destroy or benefically reuse pollutants. Outputs will be used to further validate the revised effluent guidelines to be promulgated during 1979 and 1980.

benefits such as: (1) reduction of wastewater volume, (2) reduction of intake water, (3) cost and energy savings, (4) conservation of water and other natural resources, (5) containment of conventional and toxic pollutants, and (6) progress towards the national goal of "Zero discharge of pollutants."

The increased funds will also be used to evaluate and establish ways in which to minimize intermedia impacts from wastewater pollution abatement practices. Such impacts will include those to the air and land as well as the effect on energy consumption. Alternative technologies will be evaluated and/or developed and demonstrated to determine those that are most effective in the control, elimination, or containment of wastewater pollutant parameters with minimum intermedia impact.

A research program will be initiated to develop best management pracice (BMPs) in support of the 1977 amendments to the Clean Water Act. BMPs are mechanisms that will be used by industry to control pollution from sources (such as runoff, spills, production leaks) that are not readily covered by current effluent guideline regulations.

The hazardous incident program will continue the development of technology for the prevention, identification, and control of hazardous and toxic material spills. Criteria will be developed for use by spill response personnel in determining priorities for chemical spill cleanup and the extent to which cleanup must be conducted. Techniques will be assessed for mitigation of biological damage to and the accelerated restoration of spill impacted water and land areas.

Increased use of extramural activity will offset the reduced staffing and allow use of these positions for other priority efforts.

Major research results to be achieved in FY 1980 include:

- Determination of hazardous materials spill cleanup priorities.
- Demonstration of technology for prevention of hazardous materials spills.
- Development of control technology for control of toxic and hazardous materials spillage at plants and storage sites.
- Evaluation of performance of existing BMPs to determine effectiveness.
- Development of procedures for nondestructive testing of chemical storage tanks and other maintenance strategies.
- Development of alternate BMPs where existing ones prove inadequate.
- Determination of the extent of pollutant transfer between water and air during in-plant and end-of-pipe wastewater treatment practices.
- Determination of the extent of intermedia impact to both land and energy consumption caused by wastewater control and treatment practices.
- Development and demonstration of alternate technologies where crossmedia problems are significant.
- Treatability studies for new potentially toxic chemicals.
- Demonstration and dissemination of advanced wastewater treatment and control technologies for wastewaters which are hard to treat.

- Engineering evaluation of options to overcome technical and economic contraints to extend reuse/recycle technologies.

- Demonstration of recycle/reuse technology systems for selected industrial segments.

- Evaluation of wet air oxidation control technology for removal of priority pollutants from organic chemical manufacturing wastewaters.

- Determination of minimum production water quality necessary for nonferrous metals processes to establish recycle/reuse/cascading options in-plant.

RENEWABLE RESOURCES

1978 Accomplishments

The fiscal year 1978 resources of $4,217,100 and 36 positions for the renewable resources program were allocated among four subprograms: (1) nonirrigated crop production, (2) irrigated crop production, (3) animal production and (4) forest management. Resources included $323,500 for contracts, $1,978,300 for grants, and $573,000 for interagency agreements. Accomplishments for fiscal year 1978 included the following:

Nonirrigated Crop Production

- Completion of a study on the transportation and runoff of agricultural chemicals from small upland Piedmont watersheds. Results of the study will be useful in assessing pollutant losses from agricultural lands and in developing cost-effective land management practices to improve water quality.

- Application of pesticide transport models to estimate, for the Office of Pesticide Programs, potential environmental exposures if the pesticide dimilin were used on cotton and soybeans in the Lower Mississippi and Gulf Coast drainage areas.

- Refinement of the Agricultural Runoff Model and Nonpoint Source loading models, publication of updated user's manuals, and completion of an initial training workshop.

- Completion of two reports outlining future technology trends in agriculture and silviculture that have a potential impact on environmental quality, and assessment of the potential environmental effects of three major emerging agricultural production operations.

Irrigated Crop Production

- Presentation of a National Conference on Management of Nitrogen in Irrigated Agriculture. An integrated review of findings from a comprehensive national research effort was provided to users representing a diversity of interests. This effort helped to ensure consideration of appropriate and viable solutions, sensitive to local and national needs and priorities, to water quality problems resulting from irrigated crop production.

- Production of a sound film showing those technologies which have been demonstrated to be effective in reducing soil erosion, and sediment and nutrient losses from irrigated lands. The film is available for loan and distribution.

- Examination of present water laws in the 17 western states and evaluation of potentials for implementing improved irrigation water management technology through law interpretations or changes, making them consistent with present and prospective water quality policies and needs.

water quality problems from irrigation. The methodology was applied in three case study areas.

- Completion of an extensive study of salinity control technology in Grand Valley of western Colorado. Implementation and evaluation of technologies and recommendation of best management practices were described.

Animal Production

- Completion of an analysis of state laws and regulations that impact control and management of wastes from animal production facilities.

- Publication of reports evaluating: (1) use of aquatic plants to improve quality of water in animal waste lagoons; (2) alternative systems and technologies used to manage livestock wastes for the smaller confined production facilities in the U.S., including an economic analysis of these systems; (3) the state-of-the-art for the control of odors from animal production facilities and waste management systems; (4) manure storage facilities for dairy barn wastes; (5) the environmental impact resulting from animals produced on range and pasture; (6) conversion of cattle feedlot manure to ethylene and ammonia synthesis gas.

Forest Management

- Completion, in conjunction with the U.S. Forest Service, of a comprehensive, multi-year research and development plan to address environmental issues in silvicultural and range management activities.

- Completion of development guideline manuals for the site-specific selection of silvicultural management practices that minimize the potential for nonpoint pollution.

1979 Program

Resources devoted to the water quality renewable resources program in fiscal year 1979 are planned to be $3,139,200 and 27 positions. Research will continue in the same four areas as outlined above. Resources include funds for contracts, $152,000; grants, $1,378,400; and interagency agreements, $288,500. Program activities include the following:

Nonirrigated Crop Production

- Initiation of a full scale field evaluation program to evaluate the cost-effectiveness of best management practices to improve water quality. Emphasis in fiscal year 1979 will be directed to a site in the Corn Belt Region to begin development of an assessment of agricultural nonpoint source pollution; methods to select site specific cost-effective best management practices; evaluation of social and economic impacts of the practices; and, an analysis of implementation strategies and institutional arrangements.

- Refinement and further validation of the Agricultural Runoff Model and the Nonpoint Source Model through the field evaluation program.

- Completion of input parameters for the Agricultural Runoff Model on pesticide and nutrient absorption/desorption processes and chemical transformation kinetics to make the model more user-oriented.

- Completion of studies to evaluate the effectiveness of vegetation buffer strips for controlling runoff of sediment, nitrogen, and phosphorus under a variety of topographic and climatic conditions.

techniques to predict and evaluate trends in crop production, potential adverse environmental impacts, and effectiveness of best management practices.

Irrigated Crop Production

- Continuation of field studies in southwestern Arizona evaluating the potential of modifying irrigation management to obtain higher irrigation water use efficiency and thus reduce the adverse effects of irrigation on water quality. Any reduction in return flow achieved through irrigation management would result in an equal reduction in drainage water volume to be desalted by a planned desalination complex.

- Completion of studies: (1) demonstrating that improving the chemical quality of irrigation return flows through better farm practices is profitable due to increased crop yields and reduced fertilizer expense; (2) evaluating irrigation tailwater management technology; (3) developing manuals of best management practices for salinity and nutrient control from irrigated agriculture; and (4) assessing the regional economic and environmental benefits of an irrigation scheduling service.

- Increased emphasis on transferring developed technology to the agricultural community through production of training-type films and support of on-farm implementation projects in which information dissemination is stressed.

Animal Production

- Completion of studies: (1) developing management criteria for land application of animal wastes for facilities in cold climates; (2) evaluating land application methodology and costs in the Southeast; (3) comparing dairy manure management systems; (4) evaluating vegetative filters as runoff control systems for small feedlots in the Midwest; (5) developing a manual for evaluating the runoff potential from land application practices; (6) evaluating the cost effectiveness of animal waste application methods and runoff control measures; and (7) developing design factors for storage and retention facilities for animal waste runoff.

- Continuation of studies: (1) investigating the behavior of animal wastes in the soil environment and the groundwater pollution potential from these wastes; (2) evaluating and demonstrating manure storage systems that conserve energy and nutrients prior to land application; (3) evaluating runoff from range and pasture operations in different climatic regions; and (4) developing a manual which will present methodologies and approaches for the development of best management practices for facilities with livestock on pasture and range.

- Expansion of activities for transfer of technology to livestock producers. Translation of research reports to farmer oriented manuals and increased program coordination with USDA/Extension Service will aid in directly impacting the agricultural community. Support of interagency field evaluation studies will serve to establish the relationships between animal management practices and water quality.

Forest Management

- Completion of development of a comprehensive planning model for managing a forest stand over a 20-year cycle to meet production, economic, and environmental goals.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$335,800 result from several actions. A net increase of +$97,900 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$433,700 was reprogrammed from this activity to urban systems, toxic and residuals management ($135,100) within this media and to scientific assessment ($298,600) within the interdisciplinary media.

agricultural and forestry nonpoint source problem and to evaluate best management practices for alleviating environmental problems from these sources. Requested resources include funds for contracts, $153,200; grants, $1,391,500; and interagency agreements, $290,800.

Nonirrigated Crop Production

Major emphasis will be on a Field Evaluation Program (FEP), with an overall objective of monitoring and assessing field evaluation sites in an effort to examine alternate best management practices (BMPs) designed to improve water quality and to refine and further validate assessment prediction methodology. The program encompasses both the validation of previously developed technology and development of new methodology to: assess water quality problems resulting from agricultural management practices, including identification of critical or most significant problem areas within watersheds; select site specific cost-effective BMPs; evaluate social and economic impacts of the BMPs; and, analyze implementation strategies and institutional arrangements. The complexity of field evaluations will vary from site to site in the major crop production regions; however, a goal is to produce methods that are appropriate for conducting evaluations over a wide range of crops, climate and soil conditions. Sites to be utilized in the FEP will include: Office of Research and Development controlled demonstration sites; Model Implementation Program sites being developed under an EPA - USDA cooperative agreement; and, Rural Clean Water Program watershed sites being developed under Section 208(j), PL 95-217. Also, sites may be selected where work is being done under the Clean Lakes and Great Lakes programs. Close coordination with the Office of Health and Ecological Effects will assure that the evaluations include water quality (stream and lake) enhancement aspects.

Irrigated Crop Production

Major emphasis will continue to be directed to a field evaluation program assessing improved water application techniques and the refining of measurement methodology to reduce return flow pollutants. Several projects will be completed including irrigation efficiency improvement in Arizona, recommendation of best available practices for minimizing pollution from irrigated agriculture in the Central Plains, development of fertilizer and irrigation management practices for maximum nutrient use efficiency, development and verification of a model for predicting sensitivity of irrigation efficiency to system variables, and an assessment of spatial and geographic variability of hydraulic conductivity of field soils.

Studies will continue on pesticides in surface runoff and groundwater as affected by pesticide applications and irrigation management practices, and on implementation of improved irrigated agriculture management practices to control sediment and nutrient pollution in return flows. Work will also continue on a field evaluation of the effects of irrigation management practices on the quality of irrigation return flows and the use of field data to evaluate the detailed irrigation return flow model, developed in conjunction with the U.S. Bureau of Reclamation. The overall emphasis of the program will be to produce information on management practices in the form of films, non-technical manuals, demonstration field sites, and general brochures which will appeal to and be easily used by farmers and others in the agricultural community.

Animal Production

Several projects will be completed including an investigation of the groundwater pollution potential from animal wastes applied to irrigated cropland, an evaluation and demonstration of systems for storage of manure which will conserve nutrients and energy prior to land application, and an evaluation of the effects on water quality of grazing animals in the Pacific Northwest, Central Plains, and the Midwest. Also to be completed is a manual which identifies the issues related to water quality management

of developed information to the farmers/ranchers through close cooperation with USDA/Extension Service and the production of research project information in a form more directly usable by the agricultural worker.

Forest Management

The major thrust will be to work with the U.S. Forest Service and appropriate universities to encourage them to undertake research on methods to reduce or control pollution from forestry activities. New research by EPA will be limited to evaluation of best management practices developed by others.

Public Sector Activities

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increases+ Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Wastewater Control Technology	$ 6,228	$ 6,113	$14,566	$ 6,431	- 8,135
Urban Toxics & Residuals Management	14,533	6,627	6,661	7,927	+ 1,266
Total	$20,761	$12,740	$21,227	$14,358	- 6,869
Permanent Positions					
Wastewater Control Technology	67	60	63	61	-2
Urban Toxics & Residuals Management	44	54	54	56	+2
Total	111	114	117	117	...
Full-time Equivalency					
Wastewater Control Technology	N/A	N/A	81	82	+1
Urban Toxics & Residuals Management	N/A	N/A	70	74	+4
Total	N/A	N/A	151	156	+5

Budget Request

An appropriation of $14,358,000 and 117 positions is requested for fiscal year 1980. The request provides for an overall decrease of $6,868,800. This net decrease is the result of: a decrease of $8,000,000 in the wastewater control technology program as a result of a special increase in 1979 for a potable reuse demonstration that will not be available in fiscal year 1980, and a decrease of $134,900 and two positions in urban runoff and aquaculture research; and increases of $600,000 in the urban system, toxics and residuals management program (for grants to support excessive operation and maintenance cost for certain previously funded demonstration projects), and $666,100 and two positions to support the program for innovative and alternative technology for sludge disposal.

Program Description

The public sector subactivity develops cost effective technology in support of the EPA's strategies for achieving the water quality goals of the Clean Water Act Amendments of 1972 (PL 92-500). The program directly supports the research needs of construction grants, Section 208 areawide planning, toxic pollutants control, permits and enforcements, and nonpoint source programs. These needs generally require that the Office of Research and Development develop new technologies to meet effluent requirements, generate a data base to support Agency regulations, develop guidelines and/or policy and provide technical support. The research program is developing solutions to the following major EPA needs:

- Necessity to reduce the high cost of wastewater treatment, especially for small communities, and improve efficiency and reliability of publicly owned treatment works.

- Requirements to improve design criteria for land treatment systems.

- Solutions for the individual or small development type wastewater/disposal problems.

- Need for technology, methods and practices for the reduction of wet weather pollution from combined and storm sewers.

- Necessity to develop and evaluate methods and technologies for water conservation and reuse, including aquaculture.

- Requirements to provide technical assitance for the innovative and alternative provisions of the Clean Water Act.

- Necessity for safe, reasonable cost, and publicly acceptable sludge processing and disposal methods and technology.

- Necessity of determining source, cause and disposition for toxic compounds and heavy metals in urban systems.

- Need for improved operation and maintenance methods and practices for use in plants for both normal and special conditions.

The program is divided into two program areas: Wastewater Systems Control Technology and Urban Systems and Residuals Management. Wastewater Systems Control Technology is responsible for: (a) development of new treatment processes, (b) cost reduction methods and practices, (c) land application processes, (d) small wastewater flows, (e) urban wet weather technology, (f) water conservation and reuse, and (g) technical assistance for implementation of innovative and alternative technologies. The urban systems toxic and residuals management program is responsible for: (a) Control of toxic compounds, (b) sludge treatment and disposal technology and (c) improved operations and maintenance methods.

The wastewater systems program develops new cost-effective technology to meet higher water quality requirements in many areas. Approximately half of the treatment facilities in the country discharge to limited water quality streams, and many others are overloaded because of growth. The objective of this program is to develop, demonstrate, and evaluate the cost, reliability and efficiency of improved treatment systems. A new test and evaluation facility for program support completed in FY 1979 will be contractor operated. ORD will use the facility to evaluate performances, operating cost, and other scientific factors associated with newly developed technology for waste water treatment processes. Design data will be examined in both the experimental and actual use modes for possible revisions. This will allow researchers to maintain a constant state-of-the-art in treatment processes.

Another significant effort in the wastewater management program is cost reduction and improved efficiency of publicly owned treatment plants (POTWS). Construction and operation practices and POTW plant design will be studied to determine which factors have potential for the greatest cost reduction and improved performance. Modification to uprate the plant capability will be emphasized. From the overall management view, the thrust is to develop methodology and guidelines for systems analysis which will allow the user to improve operation efficiency. Modifications to the process which can reduce both capital and operating costs will be investigated.

wastewater treatment research activities and with related research activities undertaken by other agencies such as the Corps of Engineers and the Department of Agriculture. The research is oriented toward field evaluation and development of design manuals for three major land application methods or processes which can be utilized to achieve "best practical treatment" or "nonpolluting discharge" for municipal sewage treatment systems. Recent activity has been devoted to filling design gaps. This is necessary to update and improve the land treatment design manual. Studies are also being conducted to better understand those important mechanisms involved in successful operation of land treatment systems. Operation and management of land treatment systems will also be addressed. In addition, aquaculture systems are being developed for treatment and management of wastewater.

The treatment of small wastewater flows has recently been given high priority by the Clean Water Act Amendments of 1977. The objective of this activity is to develop practical handbooks or manuals with specific details on the design, operation, applicability, capital and operating costs, and environmental implications of alternatives available for the treatment and disposal of wastewater generated from individual homes, rural communities, and recreational vehicles. These handbooks will be used by regulatory agencies, planning agencies, consulting engineers, and the general public. Emphasis has been placed on the improvement of septic tank treatment and effluent percolation in the area of on-site disposal. In addition, the R&D program has begun to investigate and develop improved community-wide institutional arrangements for on-site disposal systems to maximize the utility and reliability of such systems. Work has also continued on small flow collection systems.

The urban runoff research program includes: problem definition and development of: manuals and aids for planners and engineers; preventive land management techniques; collection system flow control; storage, treatment, and disposal of wet weather flows and sludges; and best management practices and integrated systems. It also includes the investigation of hydrologic modification effects. Emphasis is also placed on urban nonpoint pollution controls utilizing nonstructural methods to discover lower cost control techniques. The products of this research (guidelines, manuals, methods, management tools, and supportive data) will be used by planners, designers, and policy makers in carrying out assessments and formulating solutions to urban sewered and unsewered wet weather pollution. In combined sewer abatement, the emphasis is on the development of dual use hardware or modification of existing waste treatment processes which will provide short-term, high-capacity treatment processes and systems at existing POTW for wet weather surge flows.

The objective of the water conservation and reuse program is the development of technology necessary to implement a nationwide program for water supply conservation and wastewater reuse. New direction will be given to development of devices, systems, and policies to achieve maximum reduction of unnecessary water consumption. Research on wastewater reuse will concentrate on characterizing the constituents in renovated wastewater and determining the potential health effects. A field investigation of technology (performance, cost, reliability and feasibility) for the preparation of safe and acceptable drinking water from renovated wastewater will be initiated.

The technical assistance responsibility of the Wastewater Systems Control Technology program is significant. An example is the innovative and alternative provisions of the CWA for the construction of improved wastewater treatment facilities will require strong R&D support in implementation of the I/A construction program. Technical assistance will be directed to identifying, reviewing and evaluating innovative and alternative technologies. The early products will be assessment manuels and participation in instructional seminars for Regional and State personnel.

ment. It is designed to provide the research support required by EPA's regulatory program for the control of waterborne toxics and management of wastewater residuals in urban environments and to optimize urban treatment system operations based on the criteria of capital costs, operation and maintenance costs (O&M), efficiency, reliability, energy sensitivity, and environmental improvements.

The sludge management effort focuses on developing the solutions to a myraid of problems: technological, ecological, health effects, monitoring and analysis, and socioeconomic. The program is geared to broadening the technological base for sludge utilization/disposal so as to protect the public health and the environment. This can be accomplished through an improved understanding of the fate and impacts of toxicants and nutrients on sludge processing and disposal. Sludge management research will continue to focus on techniques which reduce energy consumption.

The control of toxic pollutants in municipal wastewater effluents is a new high-priority program. Little definitive information is available concerning the extent of toxic organics and heavy metals in effluents. This program will attempt to characterize various municipal effluents and develop control options.

The urban systems program also has as a high priority area improved performance, reliability and efficiency of publicly owned treatment plants through the application of better operation and maintenance (O&M) practices, instrumentation, and control systems. The relationships between plant design, influent characteristics, O&M practices and plant performance have been studied to determine which factors have potential for the greatest cost reduction or improved performance. Emphasis in this area will be on development of new design guidelines to correct operational deficiencies and on small plants where O&M costs are high per unit production. The instrumentation and process control work will develop and evaluate strategies for process control of conventional plants. This program also develops cost-benefit analysis of competing urban-wide toxic control strategies and residuals management.

WASTEWATER SYSTEMS CONTROL TECHNOLOGY

1978 Accomplishments

During FY 1978 extramural resources were divided as follows: grants $2,649,900, contracts $924,800, interagency agreements $98,400. In FY 1978 the program:

- Demonstrated the capability of a properly designed wastewater treatment system to meet the National Interim Drinking Water Standards and to produce effluent concentrations of radioactivity, trihalomethanes and other volatile organics, metals, pesticides, TOC, turbidity, general inorganic compounds and pathogenic organisms similar to those found in finished drinking waters. This was a major finding of the EPA National Organics Reconnaissance Surveys.

- Conducted a National Symposium on Wastewater Disinfection. The symposium was attended by 500 consulting engineers, scientists, municipal design engineers and federal and state pollution control officers. The technology examined in the symposium was the culmination of several years developmental effort in various disinfection methods. Indications are that the symposium will influence selection and design of disinfection systems now planned. The result will be better efficiency and performance of real world facilities with attendant cost reduction.

- Demonstrated conclusively that a bubble diffuser ozone contactor provides the most cost-effective gas-liquid contactor for achieving given microbiological discharge limitations in filtered secondary effluent by ozone generated from air. Disinfection efficiency is dependent on ozone utilization efficiency and independent of contact time.

would be less than the amount formed if chlorine were present.

- Developed a computer-assisted high-probability spectral library for the rapid identification of compounds frequently encountered in waters and wastewaters. System restricts initial phase of computerized matching of unknown mass spectra with library spectra of compounds most frequently encountered in the recent past. This minimizes time and computer costs for conducting a search to identify organic compounds found in water and wastewater samples.

- Completed studies of 10 existing soil treatment systems to determine long-term effects of applying municipal wastewaters. The comparative evaluation is to be published in FY 1979.

- Published a two-volume report dealing with the impact of water rights law on soil treatment systems implementation. Volume I deals with the general implications of the two doctrines of water law--riparian and appropriative--while Volume II examines the application of the law and administrative regulations in a representative state.

- Developed two computer programs for predicting storage requirements for land application systems based on available standard weather station data. Programs are valuable to designers especially in designing systems for extremely cold or wet regions.

- Developed an overland flow soil treatment system for municipal wastewaters. This system promises to be an effective and economical treatment system, particularly for small communities.

- Developed a mathematical model for predicting the phosphorus sorption capabilities of various soil types used for treatment of muncipal wastewaters. The model is being used by system designers and evaluators.

- Completed the first comprehensive state-of-the-art review of wastewater aquaculture. This document will be the basis for planning future programs to develop aquaculture for treatment and management of municipal wastewaters.

- Established an urban rainfall-runoff quality data base for model calibration and verification, urban runoff characterization and data synthesis. This is an ongoing compilation of data assembled on magnetic tape and in the EPA Storet retrieval system.

- Completed and published the Sewer System Evaluation, Rehabilitation and New Construction - a Manual of Practice. This manual has been proclaimed by professional societies and trade associations to be "--a significant contribution to the state-of-the-art, and will become an invaluable reference for the operator or designer of sanitary sewer systems." Its benefits will be in cost reduction of construction and rehabilitation of sewers. This is of significance when it is considered that the cost of a sewer system is usually several times the cost of the associated treatment works.

- Completed the first comprehensive study on the management of small waste flows. This study was to conceive, evaluate and develop satisfactory methods for on-site treatment and disposal of wastewaters, regardless of site constraints. The research included studies on characterization of household and commercial wastewaters, assessment of wastewater treatment alternatives, evaluation of soils for treatment and disposal of wastewater, estimation of infiltration capacities of soils, design and operation of alternative systems dependent upon soil design and operation of alternative systems not dependent upon soil, management of on-site disposal systems and institutional and regulatory control of on-site systems. This study was conducted by the University of Wisconsin during the period July 1971 to June 1977.

Completed a study in Bend, Oregon on a vacuum system collecting raw domestic sewage and a pressure sewer system collecting domestic septic tank effluent. The systems were operated and monitored for a period of approximately one year. The systems were evaluated for construction costs, operation and maintenance costs, reliability, operating characteristics, and chemical characteristics of collected sewage and septic effluent. Both systems operated, collected and transported sewage successfully.

- Completed and published the findings on an innovative sewer construction method. This method is commonly identified as "trenchless" because it eliminated the need for digging an open trench in which to place the pipe. A side-by-side comparison was made between the innovative and conventional methods. The results were outstanding. Under like conditions the cost of conventional methods was $23.15 per ft. and for the "trenchless method" $19.39 per ft. This construction method could result in a savings of millions of dollars to local communities where the construction method is applicable.

- Completed the developmental phase of the treatment of domestic wastewater by the Reed-Trench system. The system consists of intermittent slow-sand filter trench in which reeds have been planted and a gravel elimination trench in which bulrushes are grown. It is inexpensive, requires minimum attention and little energy. It is ideal for small communities, and when coupled with pressure collection systems, offers an alternative to conventional methods.

- Completed the manual of practice that analyzes the results of three flow equalization projects. The manual provides a detailed method of analysis for selecting or rejecting flow equalization as a method of upgrading plant operations.

1979 Program

The total resources for FY 1979 are 63 positions and $14,565,900. Expenditures planned for grants are $11,445,500; contracts, $617,000; interagency agreements, $105,000. Highlights and trends of the FY 1979 program are as follows:

New Technology Alternatives and Process Development

The thrust of the program is bioengineering technology development. The subdivisions are pathogenic microorganism control, specific pollutant control and advancement of state-of-the-art development.

The pathogenic microorganism control program will be devoted mainly to summarizing and evaluating several years effort in hardware development. Many extramural projects will be terminating. The results to date indicate good progress has been made in all aspects of the program, especially in cost reduction for disinfection. In 1979, a characterization and ranking of disinfection processes will be initiated; each alternative will be evaluated; and quantitative estimates will be made for specified categories to aid design engineers and municipal planners in deciding how best to approach pathogenic organic control in a specific situation.

With respect to specific pollutants, nutrient control research is being phased down. The state-of-the-art is well ahead of application. No new projects are planned for FY 1979, although the program will not be stopped completely. In hazardous organic control, the work is focused on coordinating with the toxic control program. Efforts emphasize its evaluation of various biological processes for removal of specific priority compounds.

In advancing the state-of-the-art, the aim is to develop and/or evaluate a new generation of biological treatment processes. Areas of concentration are reduced sludge production and improved efficiency and conservation of natural resources. The efforts in FY 1979 will be directed to developing vertically aligned biological reactors, hybrid biological systems and control of organism infestations which adversely effect activated sludge operation.

This effort brings together the findings of the O&M and instrumentation programs in Urban Systems & Residuals Management with the new process development in Wastewater Systems Control Technology to identify where O&M costs can be reduced by new or improved processes.

The mechanics for storing data on process cost are largely the responsibility of the Urban Systems & Residuals Management program; however, process or system modifications which reduce capital costs, energy requirements and uprate plant capability are the responsibility of the various programs within Wastewater Systems. The continuing objective is to identify the opportunities for cost reduction discovered by any one program for application to, or direction of, other programs. Presently, the principal charge for this objective lies within the Urban Systems area.

Land (Soil) Treatment Systems

The principal thrust is completion of studies on the long term effects of soil treatment systems and an interim assessment of research progress on overland flow design information. This material will serve to update the process design manual. A major project demonstrating the application of wastewater to the land will be underway at Lubbock, Texas. Currently, estimated to cost $9.5 million and to require about six-years to complete, the project will accomplish a side-by-side comparison of the latest soil treatment technology with a similar facility which has been in service for more than 40 years. Information gathered from the project is expected to update the design manual and resolve many of the potential health effects issues relating to soil treatment systems. Current estimates indicate that $5.0 to $5.6 million will be applied to project design and construction, and that $3.9 to $4.5 million will be utilized for several years of research.

A task force of three specialists, one from EPA's Robert S. Kerr Research Laboratory and one each from Regions VI and VII, has been formed to give technical assistance to, and evaluation of, land treatment processes in operation. This in effect is an implementation program which marries the research developments with actual operational findings. It will provide immediate application of research results and in turn give guidance to future R&D needs.

Small Wastewater Flows

The small flows program will concentrate on activities in septage handling at community facilities, analysis of rural community wastewater alternatives; identification, evaluation and comparison of on-site wastewater alternatives; establishment of a clearinghouse for small wastewater flow systems and some continuing efforts on advanced collection systems. Anticipatory studies which will guide development of cost effective technology for the 21st century will be initiated. Development of design criteria for the most promising alternative on-site systems as well as investigation of conservation and public health aspects of individual home units will continue.

Urban Runoff (Storm and Combined Sewer Pollution Control)

This program addresses the urban wet weather pollution problem in the total system concept. The program has five major subdivisions: (a) problem assessment (urban runoff), (b) technology development/cost effectiveness, (c) management and user assistance tools, (d) remedial considerations, and (e) best management practices.

In 1979, urban wet weather pollution assessment activities will be maintained for specific cases only. At selected sites where remedial action is to be taken, baseline receiving water conditions and the after-correction conditions will be established. This program will be conducted in conjunction with best management practice projects.

treatment will be investigated in such hardware as hydrobrake application, helical bend separators, sewer sealant development and "dual-use" treatment processes. The production of a manual for selecting urban runoff control techniques will be initiated along with a statistical data handbook for selecting design criteria and storage design considerations. Remedial considerations will concentrate on sludge disposal methods since the characteristics of urban runoff sludge and problems associated with it differ from normal wastewaters.

Development and evaluation of best management practices will consume a major portion of the program effort. Several projects such as urban lake recovery, marsh or wet land utilization and street cleaning methods will be continued. New projects will be initiated in the area of improved porous pavement, sewer flushing and urban vegetative practices for rate and volume attenuation.

Water Conservation, Renovation and Reuse

The reuse program will develop feasible strategies to extend valuable water supplied by source substitution and undertake long-term research aimed at evaluating the feasibility of reusing wastewater for potable purposes. Guidelines will be developed for municipalities to implement source substitution projects and characterize the biological, organic, and inorganic residues in wastewater effluents. This program will be coordinated with the Dept. of Interior's Office of Water Research and Technology and EPA's Office of Drinking Water.

Two major field projects will be initiated in FY 1979: a seven million dollar five-year project with the Denver Water Board will demonstrate the potential for producing potable water from domestic wastewater and a one million dollar effort which will be selected from competitive applications to demonstrate potable reuse technology.

Technical Assistance for Implementation of Innovative and Alternative Technology

The Clean Water Act provisions establish an innovative and alternative technology implementation incentive to local communities which will, over several years, amount to billions of additional dollars. This research area will provide the technical assistance in implementing this program. In FY 1979, the "Innovative Alternative Technology Assessment Manual" will be finalized; a training program for regional and other internal units involved in funding decisions will be conducted; and technology evaluation and on-site assistance will be provided as required.

1979 Explanation of Changes from Budget Estimate

The net increases of +$8,452,900 results from several actions. The Congress provided an add-on of +$8,000,000 for the reuse of wastewaters for agricultural purposes. A net increase of +$493,200 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$40,300 was reprogrammed within this activity to urban systems toxic and residuals management.

1980 Plan

Requested resources for FY 1980 are $6,431,000 dollars and 61 positions. This is a decrease of $8,134,900 and two positions from 1979, of which $8,000,000 is associated with 1979 Congressional add-on for potable reuse not carried forward in 1980. The remaining decrease of $134,900 and two positions is discussed below. Planned FY 1980, extramural expenditures are: grants $3,408,400; contracts, $726,700, and interagency agreements, $122,200. Highlights of the FY 1980 plan are the following:

particularly, low cost, highly efficient, more reliable, lower maintenance and less energy intensive treatment methods. Work on the bio-degradation of specific hazardous pollutants will continue. Research to evaluate the PhoStrip process and innovative fine bubble nitrification process in reference to design factors will be initiated.

Wastewater Treatment Cost Reduction

Process control strategies will continue to be tested to determine cost effectiveness and improvement of plant operations. A project to improve the efficiency of air aeration systems will be initiated. Cooperative efforts in exchanging and integrating cost reduction methods will continue in FY 1980.

Land (Soil) Treatment

The soil treatment program for FY 1980 will extend overland flow process investigation to colder climates; complete nutrient management models for nitrogen and phosphorus; develop management practices for irrigation and rapid infiltration to colder climates; continue data development for input into comprehensive design manuals for the three major soil systems; continue work on fate of toxics in soil; and begin to develop management systems to minimize their effects.

The aquaculture program will expand work on macrophytes (large leaf plants) and begin to evaluate use of other natural systems for wastewater treatment (in cooperation with the urban runoff program and other agencies). However, planned work on field evaluations will be reduced by $67,500 and one position.

Small Wastewater Flows

In FY 1980 a program to develop seasonal and community sized subsurface disposal systems will be initiated. The fate of toxics in individual home treatment units will be determined. A septage handbook for the collection, treatment and disposal of pumpout from septic tanks will be completed and the basic investigation of forward-looking waste handling systems tailored to anticipated future construction priorities will continue.

Urban Runoff (Storm and Combined Sewer Pollution Control)

During FY 1980, the major activity in technology development assessment will be to develop and evaluate best management practices via low and nonstructural methods. Efforts will continue on controlled release, up-system storage, and in-line liquid/solids separation methods. Continued efforts will be made in the development of flexible treatment methods which can be used at existing treatment works as dual or multi-use facilities. These include high gradient magnetic separation and ultra-high-rate filtration. Work in bottom effects and toxicants for receiving water impact determinations will be continued. Urban hydraulic controls for pollutant removal will continue to be evaluated. Emphasis will shift from problem assessment to user assistance; reflecting a decrease of $67,400 and one position.

Water Conservation, Renovation and Reuse

The efforts of this program will be directed to continuing the major projects started in FY 1979. This year and the next few years will be a period of data gathering, project management and evaluation.

Technical Assistance Innovative and Alternative Technology (I/A)

A limited amount of effort will be shifted to support the implementation of the innovative and alternative technology construction grant program. There are a large number of variable factors, such as reaction of the municipalities and states to the I/A program, regional capability in technical review and others which will influence the required R&D effort.

During 1978, resources totaled $14,532,900 and 44 positions. Extramural resources were divided as follows: grants, $12,370,700; contracts $1,001,800; and interagency agreements $106,600. During 1978 the program included:

- Developed first generation analytical methodology for assessing priority pollutants in municipal sludge and raw wastewater. These methods will be used by the Effluent Guidelines Division during their 40-city priority pollutants survey and help to establish further agency pretreatment policy.

- Conducted a series of regional workshops and distributed a comprehensive publication on the latest design practices for sludge treatment, disposal and land application. This publication has been widely distributed for use by consulting engineers and municipalities.

- Completed an operations manual on sludge composting in cooperation with USDA Agricultural Research Service. This method of sludge stabilization is gaining in acceptance because of its simple operation and design features and its relatively low initial capital cost.

- Completed a national operation and maintenance (O&M) cause and effect survey; the first large scale research effort to identify and quantify specific cause and effect relationships in problems of performance of biological wastewater treatment plants. The results from this study indicate new research areas (such as clarifer design improvements, sludge flow controls) which should be addressed.

- Completed a comprehensive evaluation of high efficiency sludge dewatering equipment in order to reduce costs for incineration, further processing, and transportation costs.

1979 Program

The resources for urban systems, toxics and residuals management research in FY 1979 are $6,660,900 and 54 positions. Of this amount, the following extramural expenditures are planned: grants $2,494,000; contracts $1,776,000; and interagency agreements $180,000. Highlights of the FY 1979 research program include:

Toxics Control - This program was initiated in FY 1978 and concentrated on developing the necessary analytical methodology for quantifying the priority pollutants in wastewater and sludge. In FY 1979 the emphasis will be on assisting the operating programs to assess the magnitude and composition of toxics in wastes received and discharged by publicly owned treatment works (POTWs), and to conduct urban-wide mass balance (source partitioning) of toxics and hazardous wastes. This information will be used in the development of a systems analysis approach on the overall impact of source control of toxics by pretreatment versus treatment and/or detoxification at the POTWs. Another important area to be emphasized is development of procedures which will allow for rapid determination of biodegradability and/or treatability of a chemical in a POTW system. This information will also be used to develop a treatability manual in conjunction with a manual establishing pretreatment credits for use by municipalities.

Sludge Management - This program will continue to hold a high priority due to the Agency's new regulations and policies resulting from implementation of RCRA and the 1977 CWA amendments. The program will concentrate on: the evaluation of starved-air combustion systems as a method for reducing fuel requirements and pollutant emissions; addition of solid waste to sludge combustion/pyrolysis processes (coincineration) to upgrade heat value of sludge; characterization of emissions from conventional sludge incineration; evaluation of various novel approaches to anaerobic digester operation and power generation from digester gas. Land application of sludge is increasing despite

some uncertainties concerning the health and ecological effects of some sludge components. The current program is aimed at mitigating these uncertainties. Emphasis in FY 1979 includes: development of management practices for controlling toxic chemicals (organics) and heavy metals in sludge applied to land; development of a technique which will allow designers to predict the response of plants or crops to a broad range of sludge application rates and practices; identification of design principles of sludge disposal in landfills with or without municipal refuse; evaluation of alternate nonfood chain uses of sludge. Work will begin on a sludge management planning document that will aid designers and local officials. The technology transfer design manual is undergoing major revision and will be published in FY 1979.

Urban Systems - In FY 1979, this program will focus on developing procedures and design guidelines to improve the performance of POTWs. A major effort will involve the demonstration of improved performance through the Composite Correction Program (CCP) approach on a state, county or region-wide basis. Under CCP, all factors are addressed simultaneously at a given plant rather than concentrating on only one "primary" cause of poor performance. A new initiative in FY 1979 will be the development and issuance of design guidelines for correcting deficiencies in specific unit processes.

1979 Explanation of Changes from Budget Estimate

The net increase of +$33,900 results from several actions. Congress applied a $6 million reduction to contracts and monitoring and technical support activities; the decrease applicable to this activity was -$225,400. A net increase of +$83,900 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan +$175,400 was reprogrammed within this activity from wastewater systems control technology and point source technology development ($40,300) and from renewable resources ($135,100) within this medium.

1980 Plan

The 1980 plan includes a total of $7,927,000 and 56 positions. This is an increase of $1,266,100 and two positions over FY 1979. The increase will be used for evaluation of I/A sludge management technology projects and operation and maintenance costs associated with previously funded (by ORD) demonstration projects, as authorized by section 105 (i) of the CWA.

During FY 1980, extramural expeditures are planned for grants, $3,004,300; contracts, $2,140,300; and interagency agreements, $214,000. Highlights of the FY 1980 program plan are presented below.

Toxic Control - This program will continue with the emphasis and direction of that in FY 1979. The program will expand the data collection to quantify the source and magnitude of the toxics problem in municipal wastewaters. It will also continue to emphasize the treatability research work and applicability to solving pretreatment and combined treatment problems. The program will develop cost-benefit analysis and model technology to evaluate advanced methods for reducing the discharge of potentially toxic pollutants and also identify the impacts of urban-wide toxics control strategies.

Sludge Management - The major part of this program will continue in the FY 1979 mode. However, an increase of $650,000 and two positions will be used for the evaluation of innovative and alternative sludge management technology projects built by construction grants. This activity will include technical assistance to the Regions as well as indepth post construction evaluations of projects selected for funding under Section 105(j) of the CWA. Focus will be on innovative technologies that conserve or recover energy, reduce costs, beneficially use sludge, and improve efficiency and/or reliability. Uptake studies of pesticides and organics and evaluation of long term land application sites for transport and transformation of heavy metals and microorganisms will be continued.

input to the operating programs to impact their program guidance documents. This input will continue to be in the form of brief design deficiency reports/manuals that result from research studies of actual field verification studies versus original design. This program will continue to evaluate instrumentation and control strategies as a means to achieve improvements in process reliability and efficiency of POTWs. Central management of a number of neighboring smaller POTWs will be further evaluated and recommendations for state-wide implementation made. The balance of the 1980 increase will be used to cover increased operation and maintenance costs of demonstration projects previously funded by ORD; this activity is authorized under section 105(i) of the CWA.

Monitoring and Technical Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Characterization and Measurement Methods Development.	$ 1,848	$ 2,112	$ 1,082	$ 1,946	+$ 864
Monitoring Methods and Systems.	3,763	2,623	3,820	2,907	- 913
Quality Assurance.	5,984	5,652	4,942	6,152	+ 1,210
Technical Support.	2,150	1,895	1,207	1,245	+ 38
Total	13,745	12,282	11,051	12,250	+ 1,199
Permanent Positions					
Characterization and Measurement Methods Development.	27	37	27	28	+ 1
Monitoring Methods and Systems.	53	50	56	56	...
Quality Assurance.	10	31	32	31	- 1
Technical Support.	37	28	21	10	-11
Total	127	146	136	125	-11
Full-time Equivalency					
Characterization and Measurement Methods Development.	N/A	N/A	32	41	+9
Monitoring Methods and Systems.	N/A	N/A	75	67	-8
Quality Assurance.	N/A	N/A	37	41	+4
Technical Support.	N/A	N/A	37	30	-7
Total	N/A	N/A	181	179	-2

Budget Request

An appropriation of $12,250,000 and 125 positions is requested for fiscal year 1980. This represents a net increase of $1,199,400 and a decrease of 11 positions from the fiscal year 1979 level. An increase is requested for the characterization program, $864,100 and one position. This will be utilized for the identification of toxic chemicals in effluent samples from 21 categories of industry, as required by the court, and for the development of internal maker components (i.e., reference materials) needed in the application of the master analytical scheme for the analysis of volatile organic chemicals. An increase of $1,209,900 in the quality assurance program will be used to expand the development of protocols for toxic pollutants; a one position decrease has also been made in this program. The Technical Support program reflects a slight dollar increase of $38,400 to support operational monitoring requirements for the spill prevention and control program. An 11 position decrease in this program reflects the shift of positions to higher priority areas. A decrease of $913,000 in the monitoring methods program reflects a planned reduction in resources for development of new methods for toxic pollutants.

Program Description

The water quality monitoring and technical support program includes four major components: (1) characterization and measurement methods development for observing pollutants contained in surface and ground waters, sludges and soils, and effluents from municipal, industrial, and non-point sources; (2) monitoring methods, techniques and equipment development which provide operation of monitoring methods through research and development and selection, modification, and adaptation of available technology; (3) quality assurance which provides practices and techniques to document data quality and monitoring systems performance for official EPA use; and (4) technical support which provides the unique expertise and facilities available in ORD for application to needs of the Agency operating programs and Regional offices.

CHARACTERIZATION AND MEASUREMENT METHODS DEVELOPMENT

1978 Accomplishments

The FY 1978 level for this subactivity was $1,847,600 and 27 positions. Of these resources, $685,600 was for contracts and $138,200 for grants. These resources were allocated to the development of analytical measurement methods applicable to water and wastewater for the: (1) identification and quantification of organic chemicals; (2) simultaneous measurement of a wide spectrum of toxic elements (e.g., heavy metals); (3) identification and quantification of different ionic species of elements; and (4) identification and quantification of asbestos fibers. The program:

- Improved the method for identification and measurement of aquatic trace organic compounds that are not amenable to gas chromatography - mass spectroscopy by developing a Fourier Transform Infrared (FTIR) spectroscopic detector for liquid chromatography, increasing the sensitivity and utility of FTIR spectroscopy, and enhancing separations with dense gas chromatography.

- Improved techniques for identifying and measuring inorganic water pollutants by enhancing the utility of plasma emission spectometry through demonstrations of its capabilities, workshops, and preparation of reference information.

- Reviewed performance contractors using the Analytical Protocol for Priority Pollutants to identify and measure 129 toxic substances in approximately 4000 samples from industrial wastewaters. Resolved through laboratory experimentation technical problems in applying these protocol to complex wastes.

- Improved techniques for sampling and concentrating organic chemicals in water.

- Developed a rapid screening technique for identifying and measuring chrysotile asbestos in water and established an optimum sample preparation technique for its electron microscopic analysis.

1979 Program

The FY 1979 resource level for the characterization and measurement methods development program is $1,081,900 and 27 positions. Of these resources approximately $23,000 will be used for contracts and $27,000 for interagency agreements.

Major activities in FY 1979 include the development of a master analytical scheme for the analysis of volatile organic chemicals in water and wastewater. This will also entail the development of internal marker compounds for use in accurate quantification of the compounds identified.

The effort on nonvolatile organics will be increased by shifting some resources from the volatile organics activity. Work on separation techniques will continue and a preliminary version of a spectral generating detector will be available for trial. The procedures needed to confirm the identity of these nonvolatile organics will be studied and utilized on an interim basis to investigate emergencies involving these compounds.

The work on methods for the simultaneous measurement of chemical elements will be continued at the same level of effort. Emphasis will be given to completion of a report on the application of x-ray fluorescence to water analysis and demonstration of the application of rapid multielement techniques for measurement of consent decree pollutants.

The research effort on methods to identify and quantify inorganic chemical species in water, needed for accurate toxicology assessments, will be continued at a low level.

A significant level of effort will be devoted to providing technical assistance to identify and quantify all toxic organic chemicals present in industrial effluents. Emphasis now will be on toxic chemicals other than those listed in the consent decree.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,030,100 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$250,000. A net increase of +$95,900 results from increased pay cost from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$876,000 was reprogrammed from this element to monitoring methods and systems ($430,800), within this activity and to anticipatory research and development ($350,000) and to scientific assessment within the interdisciplinary medi m ($95,200).

1980 Plan

The requested FY 1980 resources are $1,946,000 and 28 positions,an increase of $864,000. Of these resources, approximately $42,000 will be used for contracts and $50,600 for interagency agreements.

Of the planned increase $364,000 will be used to accelerate the assistance being given to the Effluent Guidelines Division in the identification of toxic organic chemicals common to effluents from 21 categories of industry. The remaining $500,000 of the increase will be used to develop internal marker compounds needed for calibration purposes in the application of the maste analytical scheme for analyzing volatile organic chemicals.

This fiscal year, work on the first generation master analytical scheme for volatile organic chemicals will be completed. Work on methods for confirming tentative chemical identifications in a more cost-effective manner will be continued. Greater emphasis will be given to the development of analytical methods for nonvolatile organic compounds, employing reverse phase high pressure liquid chromatography and appropriate detectors. In the multielement methods area, work will be initiated on techniques applicable to soil and sediment. In the chemical speciation area, work will be initiated on a first generation method for providing chemical and physical characteristics of particulates in water.

MONITORING METHODS AND SYSTEMS

1978 Accomplishments

The 1978 resources of $3,763,200 supported research, development, adaption, and evaluation of analytical measurement methods for use in Federal and State monitoring and enforcement programs. Approximately $140,000 was obligated for contracts, and $120,000 for interagency agreements.

Outputs of the 1978 program included:

- Test procedures for identification and quantification of polybromated biphenols (PBBs).

- Analytical techniques for continuous measurement of heavy metals by x-ray fluorescence.

- Analytical procedures for determination of volatile organics.

- Analytical procedures for trihalomethanes and other carcinogenic trace organics.

- The publication of procedures for measurement of toxic waste effluents.

- A revised edition of *Microbiological Methods for Monitoring the Environment.

- A revised methods manual to include Consent Decree pollutants.

1979 Program

The FY 1979 resources for this program are $3,820,000 and 56 positions including $260,000 for contracts, $500,000 for an interagency agreement, and $200,000 for research grants. These resources are being used to develop, adapt and evaluate monitoring and analytical reference methods for field application to support the Agency's programs and activities concerned with the measurement of pollutants in fresh and marine waters.

Planned outputs for FY 1979 are:

- Monitoring and analytical reference methods in support of the National Pollution Discharge Elimination System (NPDES).

- Revised editions of methods manuals for monitoring chemical pollutants, pathogens and biological indicators of water quality.

- Improved techniques, including automated techniques for recovery, concentration and detection of viruses and other pathogens contained in sewage, sludges, and municipal and industrial effluents.

- Bioassay techniques for monitoring the toxicity of wastewaters and ambient waters.

1979 Explanation of Changes from Budget Estimates

The net increase of +$1,197,000 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$501,000. A net increase of +$200,800 results from increased pay cost from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the gency's intensive review of priorities and changing resource requirements for its FY 1979 operating plan +$1,497,200 was reprogrammed within this activity from characterization and measurement methods development ($430,800), quality assurance ($759,500), and technical support ($306,900).

1980 Plan

The FY 1980 budget request is $2,907,000 and 56 positions,a decrease of $913,000 to reflect a curtailment in the development of new methods for toxic pollutants related to the consent decree. This program will apply $550,000 for contracts and $60,000 for research grants.

Activities and outputs will include:

- Development of reference methods and instruments for monitoring waters in support of the NPDES program.

- Development of a system for monitoring nonpoint source pollutants in semiarid regions;

- Development of procedures for concentrating pathogens from high-rate processing of wastewater and a comparative study on cell lines for recovery of waterborne pathogenic material from dredges, sludges, and wastewater.

- Development of methods for associating phytoplankton populations with trophic classification.

- Development of wide-area sensors for chlorophyll and petroleum detection.

- Development of unattended waterborne pollutant sensors for specific ions, dissolved nutrients, and pesticides.

QUALITY ASSURANCE

1978 Accomplishments

The 1978 resource level for quality assurance was $5,983,300 and 10 positions including $3,712,000 for contracts, $195,000 for interagency agreements, and $259,300 for research grants.

Accomplishments of the 1978 program included:

- Interlaboratory studies for 20 chlorinated hydrocarbon pesticides, 26 volatile organics on the toxic pollutants list, and two methods for the analysis of radium-228 in water.

- Awarded contracts to refine analytical procedures for: (1) analysis of haloethers in water; (2) use of macroreticular resins for isolation and clean up of phenols in water; (3) test procedures for analysis of terrachlordibensodioxin, polychlorinated biphenyls, and pesticides in sludges; and (4) field shakedown test procedures for organic toxic pollutants in wastewater for the Best Available Technology (BAT) survey.

- Distributed quality control samples to Regional, State, and local laboratories including: (1) sixteen thousand reference samples for evaluation of water pollution laboratories; (2) 8000 reference samples for nine volatile organic pollutants; (3) 16,000 reference samples in two series for 18 volatile toxic pollutants; (4) 3000 nonfilteerable, filterable, and volatile residue quality control samples; (5) 200,000 quality control check samples for trace metals, nitrate/fluoride, chlorinated hydrocarbon pesticides, herbicides, and minerals; (6) 1000 quality control check samples to EPA, Federal, State, local government, and private laboratories for the National Pollution Discharge Elimination System (NPDES) compliance and enforcement needs, for ambient monitoring, and fosr research; and (7) 300 radio-nuclide reference solutions. These samples are provided to assure that analytical laboratories and/or analysts are conducting the analyses in an acceptable manner, in terms of data precision and accuracy. Through this mechanism, the quality of the resulting data is known.

- Developed a new quality control sample for oil and grease measurements.

- Developed a new performance evaluation sample series for cyanide and residual chlorine analysis.

for use in microbiological analysis quality control.

- Evaluated 119 laboratories for analytical proficiency in the analyses of 44 water pollution parameters.

- Expanded mass spectral data base from 25,557 to 31,613.

- Completed improvements to laboratory automation systems in two Regional and two R&D laboratories.

1979 Program

The 1979 resources for Water Quality-Quality Assurance are $4,942,100 and 32 positions including $3,602,800 for contracts and $40,700 for research grants. The outputs of the FY 1979 program will include:

- Standardized measurement systems to support the current NPDES permits system.

- Approved reference methods for 28 toxic pollutants.

- Initiation of studies of new reference methods for 39 additional toxic pollutants.

- Quality assurance guidelines for sampling and flow measurement.

- Equivalency evaluations to include radiochemical analytical methods for NPDES support.

- Technical assistance to implement a pilot program for evaluating the performance of the NPDES self-monitoring laboratories.

- 65 new quality control samples developed for NPDES and Section 307(a) toxic pollutants.

- 3000 quality control samples for distribution to support the NPDES permits system.

- Nine series of samples for water quality analyst performance evaluation studies.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$709,900 results from several actions. A net increase of +$49,600 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the agency intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan - $759,500 was reprogrammed within this activity to monitoring methods and systems.

1980 Plan

The FY 1980 appropriations request includes resources of $6,152,000 and 31 positions of which approximately $4,488,000 will be used extramurally. The 1980 quality assurance program will focus on support of the NPDES permit system, the equivalency program, and Regional laboratory automation efforts. The quality assurance program is increased by $1,209,900 to expand the development of protocols for toxic pollutants; however this program reflects a one position decrease.

- Analytical methodology for monitoring pollutants in the three categories of purgeables, acrolein acrylonitrile dichlorodifluoromethane, and toxic metals through testing and evaluating studies to meet the requirements of Section 307 of PL 95-217.

- Methods validation studies to meet Agency requirements for monitoring trace metals and PCBs in marine environments and for the NPDES monitoring requirement for pesticides.

laboratories including: (1) Quality control samples for the measurement of water quality effluents to support BAT; (2) Quality control samples for measuring pollutants regulated under Sections 104, 106, 208, 304(h) and 307(a) of PL 95-217; (3) Quality control samples for measuring pollutants in marine samples in support of the NPDES; and performance evaluation samples for water quality laboratory evaluation studies.

- Quality assurance manuals, guidelines, and reports and manuals of verified and validated quality control procedures for analytical methods.

- Assistance to Regions and States in the evaluation of regulated water/wastewater monitoring activities.

- Evaluation and validation of the equivalency of analytical measurement systems.

- Development of National guidances to assure uniformity in laboratory evaluation of NPDES compliance monitoring laboratories.

- A working, computerized interlaboratory test system for EPA, State, and other NPDES laboratories.

- Expanded and improved Mass Spectral Search program for toxic pollutants.

- Quality assurance guidelines for proper pretreatment or separation of industrial effluents containing toxic substances prior to discharging into publicly-owned treatment works;

- Quality assurance guidelines for analyzing sludges resulting from pretreatment or separation of industrial effluents to ensure that leachates from these sludges will not contaminate drinking water supplies;

- Quality assurance guidelines for measuring radionuclides in effluents and wastewaters.

TECHNICAL SUPPORT

1978 Accomplishments

In 1978 resources obligated for technical support were $2,150,400 and 37 positions. Approximately $301,000 was obligated for contracts.

Major activities in 1978 were:

- Testimony on health hazards of viruses in treatment plant effluent that contributed directly to a court decision in favor of EPA.

- Deployment of Enviro-pods to Regions IV and VI and the Environmental Research Laboratory, Narragansett.

- Completed water surveys of the Atchafalya Basin and Lake Tahoe to assist in development of basin management plans;

- Completed a field study in the Lake Tahoe Basin to assess the effectiveness of meadows and marshlands in reducing nutrient loading.

- Developed, in conjunction with NASA, a method for determining trophic classification of many lakes over large georgraphic areas using LANDSAT data together with limited in-situ sampling.

- Analyzed chemical and radiological water samples for the Rural Water Survey including 56 water samples for gross alpha, and radium 226/228.

- Expanded the nationwide EPA application of remote sensing using aerial photography and aircraft/satellite multispectral scanning techniques for more effective environmental assessment and surveillance of water quality conditions and impacts. Data gathering and analysis projects were conducted for the following programs: 14 for Office of Enforcement, 12 for Spill Prevention Control and Countermeasure, 14 for Regional impact analysis, 2 for Section 208, of PL 92-500, and 9 for application engineering;

- Initiated a program to study wetlands in the Southeastern and gulf coast regions of the United States.

- Responded to requests for assistance for eight emergency spills.

- Provided assistance to the Office of Water Programs in determining the presence and extent of pollution in and around hazardous waste sites.

- Provided liaison with Regional Offices.

1979 Program

The 1979 resources for Water Technical Support are $1,206,600 and 21 positions, including approximately $517,000 for extramural programs. The 1979 program includes:

- Support in the areas of spill prevention control and countermeasure, hazardous storage site assessments, and emergency oil and hazardous spill assessments.

- Assistance to the Office of Federal Activities in the preparation of Environmental Impact Statements.

- Support of Regional office requests for analytical services, field work, and overhead monitoring for programs such as the Lake Tahoe Water Quality Program, the Chesapeake Bay Study, the Kentucky Strip Mine Survey, the Atchafalaya River Basin Survey, and the Pit, Pond and Lagoon Survey in New England.

- Data collection and analysis support for eutrophication studies of lakes in Illinois and Texas;

- Analytical services for monitoring viruses in wastewater.

- Collection and analysis of sludges, river, and ocean samples for Regional Offices.

- Liaison with Regional Offices.

1979 Explanation of Changes from Current Estimate

The net decrease of -$688,400 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$470,000. A net increase of +$88,500 results from increased pay cost from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan -$306,900 was reprogrammed within this activity to monitoring methods, measurement, and systems.

1980 Plan

The 1980 resources requested for Technical Support are $1,245,000 and 10 positions. It is expected that approximately $460,000 will be applied to extramural activities. The technical support program reflects a slight dollar increase of $38,400 to support operational monitoring requirements for the spill prevention and control program. An 11 position decrease in this program reflects the shift of positions to higher priority

areas. Technical Support is a level of effort program responding to the real-time needs of the Regions and Program Offices. Based on past experience and documented plans, the following types of projects will be accomplished:

- Continued support in the area of spill prevention control and countermeasure programs, emergency oil and hazardous materials spills program assessments, and hazardous storage sites assessments;

- Overhead materials monitoring support for Environmental Impact Statement preparation.

- Consultation on analytical test procedures for the analysis of municipal, industrial, ambient marine and freshwater samples.

- Analytical Services such as the Atchafalaya River Study and the Chesapeake Bay Program. Efforts will include programs in wetlands, point and nonpoint source surveys and land use analyses.

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
			(dollars in thousands)			
Appropriation						
Water Quality Planning and Standards.....	$40,368	$31,508	$39,844	$39,189	-$655	WQ-66
Effluent Standards and Guidelines.....	40,935	26,051	24,427	29,111	+4,684	WQ-83
Grants Assistance Programs	74,221	102,400	93,990	88,730	-5,260	WQ-91
Water Quality Strategies Implementation.....	7,782	10,695	14,397	11,572	-2,825	WQ-97
Water Quality Monitoring and Analysis.....	8,161	6,584	8,835	8,562	-273	WQ-106
Municipal Source Control..	42,639	65,985	56,262	62,381	+6,119	WQ-109
Total.....	214,106	243,223	237,755	239,545	+1,790	
Permanent Positions						
Water Quality Planning and Standards.....	406	342	346	359	+13	
Effluent Standards and Guidelines.....	91	111	95	113	+18	
Grants Assistance Programs	...	...	...	...	...	
Water Quality Strategies Implementation.....	170	176	195	196	+1	
Water Quality Monitoring and Analysis.....	203	157	157	175	+18	
Municipal Source Control..	1,053	1,105	1,003	931	-72	
Total.....	1,923	1,891	1,796	1,774	-22	
Full-time Equivalency						
Water Quality Planning and Standards.....	...	...	438	446	+8	
Effluent Standards and Guidelines.....	...	...	139	152	+13	
Grants Assistance Programs	...	...	6	7	+1	
Water Quality Strategies Implementation.....	...	...	214	232	+18	
Water Quality Monitoring and Analysis.....	...	...	239	244	+5	
Municipal Source Control..	...	...	1,164	1,083	-81	
Total.....	...	...	2,200	2,164	-36	

Purpose

The objectives of the water quality abatement and control programs are to abate water pollution from industrial and municipal sources and to assist State, areawide, and local agencies in controlling water pollution from point and nonpoint sources by providing management, technical, and resource assistance.

Industrial point source control is accomplished by the development of technology-based effluent limitations. The current emphasis is on development of effluent limitations for toxic pollutants which reflect best available technology economically achievable for existing sources and which represent new source performance standards for new sources. In particular, the emphasis on toxic pollutants has required the concurrent development and use of new analytical methods, substantial increases in resources devoted to sampling and analysis activities, development of new and cost-effective analytical methods for routine monitoring of individual toxic pollutants, examination of waste water treatment technologies for effectiveness in removing toxic pollutants, and more intensive and thorough engineering investigations of specific industrial categories. These effluent limitations will be aimed at controlling the discharges of 65 classes of pollutants from 21 primary industry categories. Industrial effluent limitations are implemented through National Pollutant Discharge Elimination System (NPDES) discharge permits.

Pretreatment standards for existing and new industrial users of municipal treatment works will be developed for the 21 primary industry categories along with effluent limitations for direct dischargers. Pretreatment standards will regulate toxic pollutants which are incompatible with municipal works. Municipal point source control proceeds via Federal grants to municipal, intermunicipal, State, and interstate agencies which assist in financing the planning, design, and construction of municipal waste water treatment facilities. The grants program helps municipalities to achieve the effluent limitations required by the Act. As is the case with industries, effluent limitations are implemented through NPDES permits and construction grants are made to assist municipalities in meeting their permit conditions. Construction grant funds are allotted to each State on the basis of formulas set forth in the Clean Water Act. Within these allotments, grants are awarded on a priority basis for individual projects. Generally each project is eligible for 75 percent Federal assistance, although grants may provide up to 85 percent for projects using innovative or alternative technology in treatment facility design.

As part of the municipal construction grants program, the State management assistance grant program authorizes the use of two percent or $400,000, whichever is greater, of each State's allotment to cover the cost of delegation of the construction grants program to the States. To the extent that funds suffice, they can also be used for NPDES permit, dredge and fill, and Section 208 management of programs. The goal of this program is to allow the States, rather than EPA, to assume management of the day-to-day responsibility of construction grants activities. Because a primary responsibility for the control of pollution lies with the States, EPA's abatement and control efforts are oriented toward support of State and local efforts to develop and maintain their technical institutional and financial mechanisms in water quality management.

The primary mechanism for accomplishing this and related objectives will be comprehensive, integrated State/EPA agreements covering all water quality and directly related resource assistance programs. State/EPA agreements are the primary vehicle for accomplishing national water quality management priorities in a cost-effective way, as well as State and local priorities based on particular localized problems.

The cornerstone of the State/EPA agreement is the management, technical, and resource assistance and guidance provided to State, areawide, and local water quality planning and management agencies under the Clean Water Act. These agencies develop water quality problem assessments, water quality standards, and detailed water quality management plans with Agency assistance and national priority guidance.

Implementation programs meeting national, State, and local priority needs are supported under Section 106 State program grants, Section 314 Clean Lakes grants, and under the municipal waste treatment construction program. In addition, delegated State management of municipal waste treatment, National Pollutant Discharge Elimination System (NPDES), and dredge and fill programs can be encouraged and supported with Construction Management Assistance grants under Section 205(g).

Combine and integrated with other abatement and control, enforcement, and research programs in EPA and other Federal agencies under the State/EPA agreements, the water quality management program functions to assure sound management of surface and ground water resources, including drinking water; promotes the development and implementation of techniques, management practices and regulatory programs to control nonpoint sources of pollution; promotes the consideration of cost-effective alternatives to advanced waste treatment construction; promotes water conservation; and assures that effective pretreatment and industrial source control programs are implemented.

The abatement and control program also includes: the development and publication of water quality criteria to reflect the latest scientific knowledge on the kind and extent of all identifiable effects on health and welfare relating to Section 304(a) and in support of Section 307(a) for adding substances to the list of toxic pollutants; the review of State water quality standards to ensure that acceptable standards are established in each State, through the adoption of State proposals or the Federal promulgation process; the development and defense of hazardous substances regulations and the expansion of hazardous substances designations under Section 311; the development of guidelines, standards and regulations to correct water pollution problems resulting from such sources as in-place toxicants and discharges from vessels and aquaculture projects; the regulation, implementation and national management of a grants assistance program for the classification and restoration of the Nation's eutrophic lakes; and the national management, coordination and program development regulating the discharge of dredged or fill material, including the review and recommendation of requests from States for Section 404 permit authority.

EPA monitoring and analysis activities are coordinated with State and other Federal efforts and include ambient water quality monitoring, data collection, and dissemination of water quality data. Current programs include the establishment of basic national water monitoring programs and the analysis of monitoring data to assist in development and implementation of standards and regulations. Increasing emphasis is being placed on monitoring the toxic materials, nonpoint sources, and biological impacts.

The Marine Protection, Research, and Sanctuaries Act of 1972, as amended, authorizes EPA to regulate the disposition of materials into the oceans, excepting dredged material. Under this authority, a permit program for ocean disposal of waste has been underway since 1973. In addition, EPA has reoriented its oceans program to include a coordinated approach to the problems in the ocean environment. This reorientation includes close interaction with other Federal agencies having ocean related activities.

Primary objectives for 1980 include:

- Repromulgate revised best available technology (BAT), New Source Performance Standards (NSPS) and pretreatment standards for 22 of the 34 industries under the Settlement Agreement.

- Develop human health effects criteria for 41 toxic pollutants and promulgate revisions to State water quality standards to include those substances.

- Pursue maximum State participation in construction grants program administration through delegation of Federal activities under Section 205(g) of the Clean Water Act, where capability exists.

- Continue management of a long-range construction grants program to plan, design and construct waste treatment facilities.

- Implement national agricultural and urban storm water planning and management demonstration programs.

- Complete 20 Clean Lake projects.

- State operation of the basic water monitoring program to include toxics and biological monitoring and intensive surveys.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
State Programs Regulations and Guidelines.....	$14,423	$12,861	$15,937	$15,513	-$424
Great Lakes Program.....	5,659	3,465	6,500	6,500	...
Clean Lakes Program.....	16,201	14,977	14,721	15,000	+279
Chesapeake Bay Program.....	4,085	...	2,500	2,000	-500
NEPA Compliance/EIS Preparation.....	...	205	186	176	-10
Total.....	40,368	31,508	39,844	39,189	-655
Permanent Positions					
State Programs Regulations and Guidelines.....	366	314	306	331	+25
Great Lakes Program.....	30	7	21	15	-6
Clean Lakes Program.....	...	15	6	...	-6
Chesapeake Bay Program.....	10	...	5	5	...
NEPA Compliance/EIS Preparation.....	...	6	8	8	...
Total.....	406	342	346	359	+13
Full-time Equivalency					
State Programs Regulations and Guidelines.....	...	...	392	412	+20
Great Lakes Program.....	...	...	26	20	-6
Clean Lakes Program.....	...	...	6	...	-6
Chesapeake Bay Program.....	...	...	6	6	...
NEPA Compliance/EIS Preparation.....	...	...	8	8	...
Total.....	...	...	438	446	+8

Budget Request

An appropriation of $39,189,000 and 359 positions is requested for this activity in 1980. This is a net increase of 13 positions and a net decrease of $655,000 over the 1979 current estimate. This includes an increase of 38 regional positions. This increase, however, is offset by a decrease of 16 headquarters positions under State programs regulations and guidelines. The Great Lakes program is reduced by six positions, mainly in the water quality surveillance activity. The decrease of six positions in the clean lakes program reflects consolidation of the grant management function under water quality management, while the increase of $279,000 will provide additional grants. The $500,000 reduction in the Chesapeake Bay program reflects an equal and offsetting increase under the research and development appropriation. Included in the total request is $26,800,000 for contracts and grants.

Program Description

The water quality planning and standards subactivity includes five program elements:

State program regulations and guidelines - This element covers a broad range of activities, including technical guidance, assistance and information to State, areawide, local and other Federal agencies to assist in the planning, development, and implementation of integrated and cost-effective water pollution control programs. A major reorientation of this program was developed in 1978, which in 1979 requires integrated State/EPA agreements (SEAs) covering all water programs involving resource assistance. These include grants authorized under the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA) and the Resource Conservation and Recovery Act (RCRA), where feasible. State/EPA agreements, including SDWA and RCRA integration, become the prerequesite for funding in 1980. Adequate public participation must also be assured to facilitate meeting water quality management (WQM) objectives. Nonpoint source pollution is also addressed in this element. Control activities include: institutional and financial mechanisms at State, areawide, and local levels to assure sound management of surface and ground water resources; promoting the development and implementation of control techniques, management practices and regulatory programs; and performing economic impact and cost-effectiveness analyses of nonpoint source controls. Specific program outputs include:

- Major EPA/USDA efforts to implement agricultural best management practices (BMPs), including model implementation projects, rural clean water program management practices, mining projects, and special water quality projects by the Agricultural Conservation Program of the Agricultural Stabilization and Conservation Service (ASCS).

- Development of a comprehensive salinity control plan for the Colorado River Basin.

- Integration of water quality components in national forest land management and State forestry resource plans.

- Development with States of some control programs for mining and construction related pollution, emphasizing existing, effective State programs.

- Development and implementation of a coordinated EPA ground water assistance program.

Also included in this program element is the promotion and development of cost-effective alternatives to advanced waste treatment construction; major urban storm water runoff studies; and assuring implementation of effective pretreatment programs. Finally, the management of the clean lakes program is included and addresses several concerns: improving the knowledge basic for controlling nonpoint sources of pollution in lake watersheds; developing and further evaluating in-lake restorative procedures; establishing a permanent program within the States to systematically evaluate the conditions of their fresh water lakes and assist them to implement the necessary actions to protect or improve lake quality; and developing and implementing standards and regulations that will help meet the 1983 goals of the Act.

Great Lakes program - The second program element covered by this subactivity is the Great Lakes program, which includes both funding for the Great Lakes initiative program as well as demonstration grants authorized by Section 108(a) of the Clean Water Act of 1977. The Great Lakes National Program Office was established in 1978 to integrate and consolidate EPA Great Lakes activities and to provide coordinated support to the International Joint Commission's (IJC) Great Lakes Water Quality Board.

Clean lakes program - The third program element covered by this subactivity is the clean lakes program. Under this grant mechanism financial assistance is provided to States to classify their publicly owned fresh water lakes according to trophic conditions and to carry out methods and procedures to restore the quality of such lakes. The Congress has appropriated $36.3 million for fiscal years 1975-1978 to cover the requirements under Section 314. The Agency has received 144 applications for lake restoration. In 1980, the clean lakes program will be fully incorporated with the State/EPA agreement process.

Chesapeake Bay program - The fourth program element covered by this subactivity is the Chesapeake Bay program which is responsible for developing a management system to maintain and improve the overall water quality of the Chesapeake and to enable the states and localities to supplement information requirements of national water quality programs. The program emphasizes coordination of existing programs of Federal, State, and local planning and regulatory agencies and represents a significant attempt by a Federal program to understand a large ecosystem as an entity, incorporating many interdependent components.

NEPA compliance/EIS preparation - The fifth program element covered by this subactivity involves environmental impact statement (EIS) preparation in voluntary compliance with the National Environmental Policy Act (NEPA). These EISs are prepared at the discretion of the Regional Administrators.

STATE PROGRAM REGULATION AND GUIDELINES

1978 Accomplishments

In 1978, $14.4 million was obligated with principal program emphasis being placed on completion of initial Section 208 planning by the majority of State and areawide agencies. Water quality management regulations covering programs under Sections 208/106/303(e) of the Clean Water Act were revised and published for comment. The proposed regulations emphasize planning and implementation activities that follow development of the initial plans; implements new provisions of the 1977 Clean Water Act; corrects certain problems encountered with parts of the existing regulations; and implements in significant ways Presidential initiatives to consolidate Federal requirements for State and local planning and to reduce the burden of regulations on State and substate agencies. A key change in the regulation shifts the emphasis of the State/EPA agreements from the coordination of initial State and areawide planning outputs to the incorporation of additional grant programs under other statutes and a strict requirement for the implementation of Section 208 planning outputs as a condition for future funding. Development of 1979 State/EPA agreements consistent with the new regulations was begun in every State, six of which were signed by the start of 1979.

A total of $1.7 million was committed for contracts in 1978, including $800,000 committed to fostering involvement by public and local government officials in Section 208 programs. An additional $200,000 was committed for water quality management support contracts and $600,000 for development of nonpoint source best management practices and technology transfer. Approximately $100,000 was committed on water quality standards studies. Accomplishments in 1978 included:

Nonpoint Source Control

- Issued national policies on State/EPA agreements, Sections 201/208 and 208/404 relationships, advanced waste treatment (AWT), pretreatment, Sections 208/106 funding priorities, urban runoff, agricultural and construction runoff controls.

- Established Interagency Agreement (IAG) with USDA on the Rural Clean Water Programs (RCWP); reviewed and concurred in RCWP regulations issued by USDA.

- Jointly with USDA, selected seven agricultural model implementation program (MIP) projects from 50 grant applications, and initiated implementation of best management practices.

- Selected 19 potential prototype urban storm runoff projects and initiated implementation of eight projects.

Sections 208/106 Grants Management

- Developed comprehensive 5-year funding and management strategies to direct the national water quality management program, including consideration of Section 201, RCRA, SDWA, and other sources of funding in prioritizing the use of Section 208 funds and to avoid duplication and overlap of planning programs.

- Strengthened WQM grants/financial management in four regional offices through review by teams of EPA program and grant specialists.

- Received more than 175 State and areawide draft 208 plans submitted for EPA review; 54 areawide plans were sumitted with prior State certification; 10 plans were approved by EPA, while others were under review by States and/or EPA.

- Approved for implementation nearly 150 water quality problem solutions developed as part of Section 208 plans.

- Awarded Section 106 grants to all States and interstate agencies, and 100 Section 208 continuation grants.

Public Participation

- Provided funding support, averaging $7,000 in each State for grassroots activities to inform and involve: 201 management agencies in Section 208 planning; State legislators in development and support of water quality management agency legislative initiatives; citizen leaders in statewide coalition efforts to strengthen public involvement at the State level.

Criteria and Standards

- Continued to formulate the basis for the water quality criteria documents covering the 65 toxic pollutants, pursuant to the Settlement Agreement in support of the Agency's toxic strategy.

- Continued to evaluate State water quality standards and recommended appropriate actions--20 State water quality standards were completely approved, 21 received partial approval and one (Nebraska) was promulgated.

Toxic and Hazardous Substances Control

- Published final hazardous substances regulations under Section 311.

- Completed the mitigation feasibility study of Kepone in the James River, Virginia.

Clean Lakes Management

- Conducted a national conference on lake restoration; drafted a proposed regulation for granting lake restoration projects under Section 314.

1979 Program

The current 1979, allocation for this effort is $15,937,000 and 306 positions.

The water quality management program will be entering a new phase of effort to ensure that 1979 State/EPA agreements (SEAs), particularly annual outputs funded under Sections 208, 106, and 314, are realized. In addition, primary emphasis for 1979 for water quality management (WQM) personnel will be to participate in negotiations of broader, more comprehensive 1980 agreements to guide WQM and other programs under the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA) and the Resource Conservation and Recovery act (RCRA). Coordinated approaches to toxic problems will be addressed as a priority in the SEAs.

Also in 1979, a major program effort will be to ensure implementation of initial Section 208 plans. Initial planning was completed for most areawide agencies by the end of 1978, and all States and other areawide agencies will be completed by July 1979 under the provisions of the CWA of 1977. Working with States to facilitate their plan certification responsibilities, completing the EPA review and approval of initial plans, and awarding continuing planning grants to successful agencies will be a major work load.

Grant programs under Sections 208 and 106 of the CWA will provide approximately $150 million through negotiated SEAs to States, interstate, areawide, and local agencies. 1979 new obligational authority is $41 million available for 2-years under Section 208, and $52.4 million under Section 106, also available for 2-years. (See the grants assistance program subactivity for further description.)

Approximately $900,000 is available for the management of the clean lakes grant program, providing program coordination and developing regulations, standards, and polciy guidance for correcting water pollution problems resulting from toxic pollutants, hazardous substances, in-place toxicants, discharges from vessels and aquaculture projects. An additional $275,000 will be used to contract for a feasibility study on the mitigation of polychlorinated biphenyls (PCBs) and polybrominated biphenyls (PBBs) in the Saginaw and Pine Rivers, Michigan.

In 1979, $3,135,000 is planned for contracts including $980,000 for fostering involvement by public and local government officials in Section 208 programs. An additional $650,000 is planned for water quality management support contracts and $900,000 for nonpoint source control, including urban runoff, erosion and soil conservation studies. Toxics removal from the Pine and Saginaw rivers in Michigan will receive $275,000. Strategy development will require about $330,000.

in 1979, program plans include:

State/EPA Agreements (SEAs)

- Develop in all regions and most States comprehensive integrated SEAs for 1980, incorporating to the extent feasible programs under CWA, SDWA, and RCRA (including toxics problems). Negotiations of comprehensive SEAs with additional States are to be concluded early in 1980.

Nonpoint Source Controls

- Provide expert technical assistance to State and areawide agencies through contracts, grants, and interagency agreements (IAGs) for advanced waste treatment (AWT), urban runoff, and nonpoint source areas including agriculture, silviculture, and ground water.

- Participate in State Rural Clean Water Coordinating Committees to assure activity and focus on WQM implementation in priority areas; evaluate Rural Clean Water Program (RCWP) applications and review BMPs proposed for cost share assistance under this USDA funded program. Control of pesticides and other hazardous substances on toxic materials in rural runoff will be emphasized.

- Select seven projects from 50 priority area candidates under the EPA/USDA Model Implementation Program (MIP) and monitor the projects selected in 1978. Provide incentive funds up to $150,000 per project.

- Work with USDA Agriculture Stabilization and Conservation Service, Agricultural Conservation Program (ACP) to implement special water quality projects focusing on BMPs, particularly addressing toxic problems. USDA has $190 million in ACP funding.

- Coordinate development of a comprehensive salinity control plan among user States for the Colorado River Basin.

- Manage eight current projects out of 30 problem areas identified to assess the magnitude and extent of urban runoff impact on water quality and work to develop nine more potential projects. Impact review will emphasize heavy metals and other toxic hazardous materials, and the effectiveness of a variety of management practices.

- Begin EPA/USDA Forest Service prototype silviculture management practices projects; implement educational programs for State foresters and forest land owners; and seek an IAG that will make the Forest Service the focal point for BMP implementation. Pesticide and herbicide problems will be addressed.

- Promote implementation of the strongest, most effective State coal mining regulatory programs and formulate EPA noncoal mining implementation strategy and implementation program. These programs will include control of toxic and hazardous material pollution from mining sources.

- Encourage States to develop and enact laws to control construction activities pollution.

- Develop, with other Office of Water and Waste Management (OWWM) program offices, a coordinated ground water policy, emphasizing protection of ground waters from toxics and hazardous materials pollution.

Sections 208/106 Grants Management

- Complete the water quality/water allocation study mandated by Section 102(d) and prepare report for submission to Congress.

- Update survey of State and areawide needs for priority funding under Sections 208 and 106 and determine ways to utilize available Section 106 funds most efficiently in water quality management by the States.

- Provide financial management and related institutional development assistance for regional/State/local officials who must review or develop Section 208 plan implementation alternatives, make critical budget choices, and manage the programs in the waste treatment facilities, construction runoff and on-lot disposal problem areas.

- Review 300 or more AWT projects as legislatively required.

- Develop pretreatment coordination strategies under Section 201/208. Fund 5-10 selected AWT planning projects.

Public Participation

- Provide public participation funds to enhance public involvement at statewide and local levels for WQM program priorities, such as SEA development, urban runoff and nonpoint sources (NPS) projects. These efforts will include $500,000 to States for public participation in WQM priority areas, and $200,000 for (1) regional public participation activities, (2) training courses on public participation/management for EPA field staff and State WQM officials, and (3) for State and local planning agency staffs on coordination of public participation activities with programs under the CWA, RCRA, and SDWA.

Criteria and Standards

- Develop and publish water quality criteria documents involving health and aquatic life on the 65 toxic pollutants mandated by the Settlement Agreement and publish in the Federal Register.

- Continue to propose and promulgate State water quality standards when State standards are disapproved by the Regional Administrator. Develop proposed regulation on water quality standards as an outgrowth of comments received on the July 10, 1978, Federal Register advance notice. This is an action to require States to address toxic pollutants in standards.

- Develop criteria to be used by States in petitioning EPA under Section 312(f)(4)(B) for prohibition of vessel waste discharge to drinking water intake zones; process State petitions for no discharge enforcement authority to control vessel sewage discharges.

Toxic and Hazardous Substances Control

- Evaluate the rationale for designating a pollutant as "toxic" under the toxic strategy and initiate action to add substances to the Section 307 toxic pollutant list. Act on petitions to remove individual pollutants from the Section 307 list of toxic pollutants as required by law; this requires Federal Register notice and decision notice.

- Expand the selection rationale under Section 311 to include bioaccumulation and chronic effects for designating a substance as "hazardous", including public health effects such as carcinogens. As appropriate, add substances to the Section 311 list of hazardous substances.

- Develop under Section 311 new regulations establishing limits of liability for oil and hazardous substance discharges; develop new hazardous substances removal regulations and provide legal defense of Section 311 regulations proposed in 1978.

Clean Lakes Management

- Promulgate clean lakes grant regulation; publish proceedings of the national lake restoration conference; and continue to review and recommend actions on clean lake grant proposals.

Program Plans and Assessments

- Develop a basic water quality strategy to provide for a balanced and integrated long-range water quality program, including analysis and resolution of fundamental issues. Include State, regional and local participation in its development.

- Initiate minimal economic impact analyses for all nonpoint source controls, with emphasis on agricultural sources and urban storm water runoff.

- Develop the Section 516(a) report on the Agency's water quality accomplishments.

1979 Explanation of Changes from Budget Estimate

The net increase of +$3,076,000 results from several actions. Congress provided an add-on of $275,000 for Saginaw/Pine River Studies. A net increase of $938,400 results from increased pay costs from the October, 1978 (1979) pay raise as well as of the October, 1977 (1978) pay raise. In addition, two functional transfers increased this element by +$1,822,100: the transfers are from the clean lakes program ($228,900) and effluent standards and guidelines ($1,593,200). The transfer from effluent standards and guidelines was primarily of economic analysis functions more appropriately allocated to this element. The transfer from clean lakes is for the management of the grants program. None of these transfers affected the 1979 plans for these activities. Finally, +$40,500 was reprogrammed to this element from NEPA compliance/EIS preparation as result of the agency's review of resource requirements for its 1979 operating plan.

1980 Plan

In 1980, $15,513,000 and 331 positions are requested for this activity, which is a decrease of $424,000 and a net increase of 25 positions. Included in this change is an increase of 38 regional positions, offset by a reduction of 16 headquarters positions.

Approximately 10 percent of the positions are for national direction of the grant programs under Sections 208 and 106 of the Clean Water Act (CWA), nonpoint source control, and State/EPA agreements (SEAs) coordination. Seventy percent are for regional administration of those programs. The remaining 20 percent of these positions are for direction and implementation of the criteria and standards and clean lakes programs, and for economic and statistical analyses of program impacts, and for water planning and standards integration and strategy development efforts.

In 1980, the water quality management (WQM) program will be emphasizing broader involvement of related programs in EPA and other Federal agencies, both to support continuing Section 208 planning and the implementation of completed plans, particularly those aspects dealing with improved advanced waste treatment (AWT) needs decisions, urban runoff control, and agricultural nonpoint source control. Control of toxics from all those sources will be emphasized. Implementation of approved plans will continue to be stressed, and successful plan implementation and approved SEAs will become a criterion for future Sections 208/106/314 funding eligibility. Improvement of State and local capabilities to obtain and manage implementation resources will continue as a high priority. In 1980, the financial management assistance program will disseminate the tools and techniques to help plan implementation funding that was developed during 1979 and will initiate development of an assistance program for agricultural and urban runoff activities.

Grant awards for State Section 106 programs, continuing Section 208 planning and Section 314 Clean Lakes programs will be committed and awarded according to priorities and phasing established in State/EPA agreements. The agreements also will include and integrate other support programs and will reflect both national priorities and major localized problems identified in the updated 1979-1981 needs survey. Funding support of national and grass roots public involvement by concerned groups will be continued with emphasis on groups with significant interests in national WQM priorities.

Clean Water act (CWA) Sections 208 and 106 grant programs, as requested, would provide approximately $89 million through negotiated State/EPA agreements (SEAs) to State, interstate, areawide, and local agencies. However, these resources will also be required to develop, negotiate and implement the integrated SEAs which include the Resource Conservation and Recovery Act (RCRA) and the Safe Drinking Water Act (SDWA) grant programs. 1980 new obligational authority requested is $40 million under Section 208 and $48.7 million under Section 106. These funds will be available for 2-years. (See grants assistance program for further description.)

Toxic pollutant water quality criteria will continue to be developed and promulgated. In 1980, 41 new toxic pollutants will be addressed through water quality criteria for control and regulation by State water quality standards under the Agency's toxic strategy. New substances will be added to the Sections 307 and 311 lists to increase the protection to humans from cancer and from other long-term (chronic) health risks.

In 1980, $600,000 will be spent on encouraging participation in the Section 208 planning management process by public and local government officials. An additional $900,000 will be committed for Section 208 case studies, planning review assistance, and water quality management assistance. The nonpoint source program will use about $1,500,000 on urban runoff control and agricultural nonpoint source pollution. Approximately $400,000 will be committed to developing water quality criteria on hazardous and toxic substances. Statistical support and economic impact analyses of nonpoint source controls and other regulations will require about $1,000,000. In 1980 the program will:

State/EPA Agreements (SEAs)

- Promulgate final State/EPA agreements (SEAs) regulations in the last quarter of 1980.

- Develop in essentially all States comprehensive integrated SEAs for 1981, incorporating programs under CWA, SDWA and RCRA (including toxic problems).

- Track implementation and provide national policy guidance to EPA regions and States on content and development of SEAs.

Nonpoint Source Controls

- Complete prototype urban runoff project selection, work plan development and funding for all prototype projects, participate in project management and evaluation, and provide national technical assistance.

- Complete work with five selected States in developing effective State laws and local ordinances to control construction related pollution, including associated toxic and hazardous materials pollution.

- Participate in national and State Rural Clean Water Programs (RCWP) Coordinating Committees and complete selection of first round RCWP implementation cost sharing projects for USDA funding, with the Administrator's concurrence. Control of toxic pollutants will continue to receive emphasis.

- Review new applications from potential RCWP cost sharing implementation projects and recommend projects for funding to the Administrator, considering toxic and hazardous materials control and a priority in selection.

- Complete Model Implementation Program (MIP) project funding; provide guidance and monitor projects jointly with the Department of Agriculture (USDA).

- Obtain commitments of Section 314, research, and other funds to support implementation of MIP plans, particularly where toxics control is involved.

- Develop interagency agreement (IAG) and work with USDA programs to assure support of Section 208 agricultural nonpoint source (NPS) plan implementation with available resources other than those for RCWP and MIP projects.

- Work with EPA and other agencies' R&D monitoring programs to provide technology transfer, including technology for control of toxics and other hazardous materials to Federal regional staff and Section 208 agencies.

- Implement ground water assistance program, with high priority given to protection of ground water from toxics and hazardous materials pollution.

- Issue expanded policy guidance, regarding water quality management (WQM) roles, in programs for the control of toxics from NPS, building on initial policies established in 1979.

- Continue to work with the Office of Water and Waste Management (OWWM) ground water policy group to implement a hands-on ground water technical assistance program in four to seven selected test areas.

Sections 208/106 Grants Management

- Implement the policy for distribution of Section 106 funds developed during 1979; base funding of State water pollution control programs on consideration of needs and national priorities, including toxic and hazardous materials control.

- Provide financial planning and fiscal management training and technical assistance to WQM agencies and State/local officials in implementing municipal waste treatment, construction runoff, and on-lot disposal programs. Additional financial/fiscal tools and techniques applicable to agricultural and urban runoff problem areas will also be developed for use in 1981.

- Revise and expand policy guidance regarding WQM roles in solving water quality/water quantity problems, based on findings of the joint report to Congress due October 31, 1979.

- Evaluate WQM procedures, processes, requirements, and accomplishments, through a continuing series of selected studies; and provide recommendations and/or management improvement action plans.

Public Participation

- Inform and promote participation in WQM of those groups and individuals most interested in and impacted by WQM planning and implementation, including: WQM agencies, Federal, State, local; WQM planning consultants; business and industry associations; public interest organizations; agricultural associations; urban groups; and professional associations.

- Provide necessary training to regions, States, and WQM agencies to carry out public participation requirements of agencywide regulations.

Criteria and Standards

- Develop human health and environmental effects criteria for 41 toxic pollutants beyond current efforts on the 65 and publish the same for public comment. Integrate Office of Research and Development data updates and health risk extrapolations into draft criteria documents. Develop notice of availability, coordinate Agency and interagency comments and prepare draft criteria for 41 substances for control under the Agency's toxic strategy.

- Promulgate revisions to water quality standards regulations requiring the States to include toxic substances in their State water quality standards. Propose and promulgate selected water quality criteria for toxic pollutants to be required in State water quality standards. Review revised water quality standards to assure incorporation of toxic pollutant criteria into State water quality standards, and promulgate standards as necessary.

- Continue to process petitions to add to or remove substances from the Section 307 toxic pollutant list.

- Promulgate regulatory criteria under Section 312 for State petitions to prohibit discharges of vessel sewage to drinking water intake zones.

Toxic and Hazardous Substances

- Promulgate regulations under Section 311(j)(1)(B) on liability limits for oil and hazardous substances and continue to add substances to the list for control and regulation under Section 311.

- Continue to expand selection criteria to include carcinogenic, mutagenic, and bioaccumulative substances for highly persistent substances under Section 311 of the Act. Propose regulations under Sections 311(j)(1)(A), 311(j)(1)(C), and 311(f)(2).

Clean Lakes Management

- Assist States with implementation of State/EPA agreements on clean lakes program requirements.

- Complete effort to input clean lakes grant water quality data into STORET, and review input of program to improve water quality.

- Conduct four EPA regional/State workshops to explain operational procedures of the clean lakes program.

- Publish a users' manual on grant assistance offered under the clean lakes program.

- Complete and distribute public awareness information about lake restoration methods and benefits.

- Continue to provide technical review for clean lakes grant applications and recommend appropriate award actions. Provide administrative attention to approximately 115 operating clean lakes grants.

- Assist State efforts to classify publicly owned fresh water lakes according to trophic condition.

- Develop agenda and conference arrangements for an international (North America/European) symposium, tentatively scheduled for New England in the fall of 1980 on clean lakes restoration. The objective of the symposium is to obtain the comprehensive national and international information available on methods and procedures for lake resotration. This information will be included in the Administrator's Section 304(j) report in 1981.

- Initiate a comprehensive cost/benefit analysis of the clean lakes program.

Program Plans and Assessments

- Expand the scope of the water quality strategy to a water and waste management strategy, which also includes water supply and solid waste programs. Emphasis will be placed on integration of all three program areas to provide overall environmental management.

- Conduct economic analyses on cost and benefits of nonpoint source controls and assist regions and States in determining tradeoffs between point and nonpoint source controls. Also, provide guidance and analytical support to States for economic analyses required as part of water quality standards downgradings.

- Develop the Section 516(a) report on the Agency's water quality accomplishments.

GREAT LAKES PROGRAM

1978 Accomplishments:

In 1978, the Great Lakes National Program Office obligated $5.7 million. Two new Section 108(a) demonstration grants were awarded to control sediment erosion and combined sewer overflow and four Section 108(a) projects were continued to address nonpoint source problem areas. Total grants awarded under Section 108(a) were $1.4 million.

EPA continued to cooperate with Canada through the Joint Great Lakes surveillance plan to monitor water quality trends and to evaluate the effectiveness of regulatory programs. Final reports on the Lake Michigan intensive survey were published, and the first year of the Lake Erie intensive survey was conducted with special emphasis on toxics, heavy metals and nutrients. Total grants and contracts for surveillance ship operations, field investigations, and data analysis totaled $2.7 million.

Special assessments were conducted on dredging, air pollutant fallout, polychlorinated biphenyls (PCB's), gas drilling and fish contaminants in cooperation with the States, Canada and other Federal agencies. Staff support emphasized efforts to increase the effectiveness of U.S. remedial programs and on integration of special studies to assess compliance by problem categories of dischargers.

1979 Program

The 1979 allocation for the Great Lakes National Program Office effort is $6,500,000 and 21 positions.

In 1979, the decrease in positions reflects a major shift to contractor assistance for data collection, laboratory analysis and quality control for the Great Lakes surveillance effort related to International Joint Commission (IJC) acitvities. The second year of the Lake Erie intensive survey will be initiated with continued emphasis on toxic substances. Contract and other costs will be $3.3 million.

but no new awards will be initiated. The storm event tributary monitoring, initiated in 1978, will be continued. Total cost for Section 108(a) awards is $1.6 million and grants for the Pollution from Land Use Activities Reference Group (PLUARG) are $435,000.

Staff support for the U.S. Chairman of the Great Lakes Water Quality Board and the Water Quality Board's working committees will be continued, including implementing the new Great Lakes Water Quality Agreement of 1978, especially as it relates to phosphorus loadings, dredging, toxic substances, water quality objectives, and atmoshperic loadings.

Technical support for Great Lakes enforcement actions will be provided and impact assessments will be conducted on key Great Lakes issues. Industrial and municipal facilities, water resource development projects, dredging proposals, and lake level fluctuations will be analyzed for their effect on Great Lakes water and air quality.

1979 Explanation of Changes from Budget Estimate

The new increase of +$3,035,000 results from several actions. Congress provided an add-on of $3,000,000 for the Great Lakes program. As a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, +$35,000 was reprogrammed to this element from the clean lakes program.

1980 Plan

In 1980, $6,500,000 and 15 positions are requested for activities related to the Great Lakes National Program Office, which is a reduction of six positions from 1979. Other efforts include support for data analysis, integration of Great Lakes planning efforts, impact assessments, and support for key enforcement actions.

The EPA Great Lakes surveillance program will concentrate on Lake Huron open lake and near shore problem areas. All field investigations and data interpretation will be conducted by contract.

Two Section 108(a) projects will be completed, those projects already in place will continue, and one new grant will be initiated to demonstrate new techniques in waste water management and sediment control.

Technical assistance and staff support will be provided to the U.S. Chairman of the International Joint Commission's Water Quality Board and limited consultation will be maintained with Canadian, Federal, State and local authorities on Great Lakes pollution problem areas and issues. Implementation of the new Great Lakes agreement will continue.

CLEAN LAKES PROGRAM

1978 Accomplishments

In 1978, $16.2 million was obligated on grants; the program:

- Funded 14 new projects and 14 amendments to existing projects.
- Reviewed nine proposals which ended in a nonaward category.
- Completed four lake restoration projects.

1979 Program

In 1979, $14,721,000 is available for grants. EPA will continue to provide financial assistance for lake restoration projects and State classification of their lakes by trophic conditions. This fiscal year EPA will:

- Fund approximately 30 State grants for lake classification.
- Fund approximately 15 new lake restoration projects.
- Fund approximately 10 amendments for existing lake projects.
- Complete approximately 10 projects.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$256,100 results from several actions. A net increase of +$7,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plans, -$35,000 was reprogrammed within this activity to the Great Lakes program. In addition, all headquarter management of the clean lakes program, -$228,900 was functionally transferred to state program regulations and guidelines. All remaining funds within this element are for clean lakes grants and regional management of the program.

1980 Plan

In 1980, the increase of $279,000 will further expand the program to meet fund demands for projects by States. In 1980, EPA will:

- Fund approximately 25 phase 1 (planning and feasibility) grants.
- Fund approximately 20 phase 2 (implementation) grants.
- Fund approximately 15 amendments to existing ongoing grant projects.
- Fund activity to evaluate cost/benefit of clean lakes program.
- Fund activity to identify new and revise existing lake restoration methods and techniques for better utilization of available funds.
- Fund the preparation of information regarding the program for distribution and greater public awareness.
- Complete approximately 20 clean lakes projects.

CHESAPEAKE BAY PROGRAM

1978 Accomplishments

During 1978, the Chesapeake Bay program obligated $4.1 million and initiated major research efforts to investigate three of the Bay's environmental problems. This included a toxics program of approximately $2.7 million to develop baseline information identifying and quantifying the distribution and concentration of toxic substances in the Chesapeake Bay. A second area investigated was the decline of submerged aquatic vegetation. This involved a $2.3 million effort to research potential causes for the decline in aquatic grasses and to further understand their ecological significance within the Bay's ecosystem.

The third area investigated was eutrophication (excess enrichment) of the Bay. Projects here are designed to produce an understanding of nutrient enrichment in an estuarine system. Also included are extensive watershed studies in subbasins in Maryland and Virginia to better understand nonpoint sources of pollution and to demonstrate both predictive models and best management practices designed to abate nonpoint source problems.

The 1978 public participation program concentrated on involving the Bay area citizens in the development and implementation of the Chesapeake Bay program. The result was the increased awareness of the Bay area public relative to the environmental problems that beset the Chesapeake Bay.

1979 Program

In 1979, $2,500,000 and 5 positions have been allocated for this effort. Major 1979 program efforts are targeted toward the development of a mathematical computer model of the circulation and hydrologic processes of the Chesapeake Bay and the development and implementation of an environmental assessment strategy for sources of toxic substances. Management studies will be conducted to determine what units of government have management responsibility for the environmental quality of the Chesapeake Bay. These investigations will also include a review of in-place ecosystem management structures (Title II Commission, River Basin Commission, etc.), their origin, and successes or failures. In addition, 1979 public participation efforts will continue and emphasize environmental threats to the Bay.

1979 Explanation of Changes from Budget Estimate

The net increase of $2.5 million results from a congressional add-on.

1980 Plan

In 1980, $2,000,000 and five positions are requested for this activity. The 1980 program will emphasize the identification of control options and management alternatives available to abate pollution problems quantified by 1978 and 1979 research. Additionally, the environmental assessment activities will stress the conduct of chemical and biological analyses of identified and potential toxic effluents inputting to the Bay system. Management study efforts are designed to analyze the units of government identified in the 1979 study to determine how such units might best be structured to improve communication and coordination.

The 1980 public participation program will continue the high level of public involvement in the Chesapeake Bay program. Emphasis will be in the area of citizen understanding and involvement in the development and implementation of control options and of management alternatives available to abate Bay pollution problems.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE/ENVIRONMENTAL IMPACT STATEMENT PREPARATION - WATER QUALITY

1978 Accomplishments

In 1978, funds and positions for this activity were included in the element municipal waste water facilities construction/NEPA compliance. While EPA is exempted from preparing environmental impact statements (EISs) for activities under the Clean Water Act (CWA), except for waste water construction grants under Section 201 and new source discharge permits under Section 402, EPA regions prepared 11 final EISs on Section 208 water quality management (WQM) plans submitted for approval. The 11 final EISs on plans with major controversial environmental impacts were based on environmental assessments developed as part of the Section 208 planning process for all WQM plans.

1979 Program

In 1979, $186,000 and eight positions will be used for this activity. In August 1978, EPA revised its policy and no longer requires the regions to prepare EISs for Section 208 WQM plans. However, as part of this policy, detailed EISs being developed on specific WQM plans will be completed. Under this provision the regions will complete another 18 final EISs. In addition, the regions continue to be responsible for assuring that the environmental assessments required in the WQM planning process are conducted in a manner consistent with the spirit and intent of NEPA, including appropriate citizen and public agency participation.

1979 Explanation of Change from Budget Estimate

The net decrease of -$18,700 results from several actions. A net increase of +$21,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, -$40,500 was reprogrammed within this activity to State program regulations and guidelines.

1980 Plan

In 1980, $176,000 and eight positions are requested for this activity. Under the new EPA policy on NEPA compliance, the regions are responsible for assuring that environmental assessments required in the WQM planning process are conducted in a manner consistent with the spirit and intent of the NEPA. Appropriate citizen and public agency participation must also be assured. More than 200 continuation planning projects funded under Section 208 will either be underway or are being developed in 1980. In addition, the last 13 final EISs will be completed on initial Section 208 WQM plans.

Abatement and Control

Effluent Standards and Guidelines

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Effluent Standards and Guidelines.....	$40,935	$26,051	$24,427	$29,111	+$4,684
Permanent Positions					
Effluent Standards and Guidelines.....	91	111	95	113	+18
Full-time Equivalency					
Effluent Standards and Guidelines.....	...	...	139	152	+13

Budget Request

An appropriation of $29,111,000 and 113 positions is requested for 1980. This is an increase of $4,684,000 and 18 positions over the 1979 level of $24,427,000 and 95 positions. The additional positions will be used to expand best available technology economically achievable (BATEA) studies to concentrate on toxic pollutants, to incorporate the development of recycle and reuse technologies into BATEA efforts, to sample and to analyze toxic pollutants discharged to and by publicly owned treatment works (POTW), to identify problems with BATEA applications, and to formulate and perform initial economic impact analyses of best management practices (BMP) to reduce pollutant loads. The funding increase will provide for identification of pollutants not currently controlled, and for development of best conventional pollutant control technology (BCT) regulations for primary industries and an additional group of secondary industries.

Program Description

The program was mandated in 1972 to develop uniform, national effluent limitations and standards for 43 major industrial categories that discharge waste into the Nation's waters. The regulations implementing these effluent limitations guidelines were promulgated under the combined authorities of Sections 301, 304, 306, and 307 of the Clean Water Act. These authorities provided for different levels of treatment technologies for the industrial categories identified by the Agency as substantial contributors to water pollution. The regulations developed were based on the demonstrated use of the best practicable control technology (BPT) then available. Designated industrial categories were to be in compliance by 1977. As a second step toward reducing the industrial contribution to water pollution, limitations based on the best available technology economically achievable (BATEA) were to be promulgated, with industrial compliance required by 1983. Section 306 of the 1972 Act required institution of standards for new industrial sources of waste water. Section 307 mandated development of pretreatment standards for those industries that discharge waste water into municipal waste water treatment works.

Although the effort to promulgate BPT standards has been completed for almost all of the designated 43 categories, further economic impact assessments and technical evaluations have been required and will be continued to respond to BPT issues and remands as determined by the Courts.

Beginning with the 1976 Settlement Agreement between EPA and National Research Defense Council et al, the Agency has continued to shift its program emphasis toward the control of toxic water pollutant discharges. In 1977 this shift was reemphasized and expanded by the Clean Water Act of 1977. The mandated expansion of the effluent guidelines program to include toxic pollutants represents a major transition from the previous program, which essentially was limited to conventional measures of water pollution. During the past 2-years this change has required a redirection of program activities and a reallocation of available resources. In particular, the emphasis on toxic pollutants has required the concurrent development and use of new analytical methods, substantial increases in resources devoted to analytical sampling and analysis activities, development of new and cost-effective analytical methods for routine monitoring of individual toxic pollutants, examination of waste water treatment technologies for effective removal of toxic pollutants, and more intensive and thorough engineering investigations of specific industrial categories.

Toxic pollutants now are being addressed by the Agency in effluent guideline program efforts including development of regulations for BATEA and new source performance standards and pretreatment standards as required by the Settlement Agreement and the 1977 Clean Water Act. These regulations will be aimed at controlling the water discharge of 65 classes of pollutants for 21 primary industrial categories. Two of these industrial categories (miscellaneous chemicals, machinery and mechanical products) were deemed too large for separate study and were divided into subparts to be treated as major categories; 34 industries were thus identified for candidate regulation. Every one of these 34 industry categories is under investigation, and some of the studies are near completion. Each category requires examination of processes in the industry, water usage, waste water characteristics, and treatment technologies either in use or potentially applicable. In addition, the requirement of economic achievability has led the Agency to conduct exhaustive studies of the financial and economic structure of each industry to assess the economic achievability of various regulatory options.

Under Section 304, the Agency is formulating best management practices (BMP) for controlling toxic pollutants originating from plant site runoff, spillage or leaks, sludge or other waste disposal, and drainage from raw material storage facilities which are associated with or ancillary to the industrial manufacturing or treatment process. Section 304 also requires EPA to develop technology based effluent limitations for so called "conventional" pollutants. Presently, conventional pollutants include only biochemical oxygen demand (BOD), total suspended solids (TSS), ph, and fecal coliform, but other "traditional" pollutant may be defined as conventional under this authority. The 1977 Act removes best available technology economically achievable (BATEA) as the appropriate control mechanism for conventional pollutants but adds a new level of technology for establishing such limitations, termed best conventional pollutant control technology (BCT).

Generally, the new technology based limitations for conventional pollutants cannot be less stringent than BPT or more stringent than BATEA standards. In this regard, the Agency is conducting a general review of existing limitations for those industries not under the toxic limitations specified in the 1977 Act. These industries have been termed "secondary industries" to differentiate them from the 34 "primary industries". The secondary industries include subcategories for which limitations were in effect at the time of passage of the 1977 Act amendments.

Consistent with Section 307(b) and (c), pretreatment standards for both existent and new industrial sources are forthcoming. These standards will include pretreatment limitations on the discharge of toxic pollutants to municipal publicly owned treatment works (POTW), consistent with the demonstrated operating performance of POTW's in effective treatment of toxics.

In developing new regulations and in reviewing existing ones, there is a major effort to incorporate legislative requirements of the Clean Water Act with those of other statutes. For example, in the development and review of BATEA regulations, new technology for recycle and reuse of industrial waste water will be developed and incorporated with the related Resources Conservation and Recovery Act (RCRA) requirements for the disposal of hazardous wastes. Studies of how best to integrate the regulatory requirements of the BATEA toxics control effort with RCRA have been initiated. RCRA hazardous waste management regulations will be coordinated with those BATEA regulations that are scheduled for promulgation over the next two years. To meet the Clean Water Act and RCRA statutory requirements for the disposal of residues, a joint effort by several EPA programs is being made. The Office of Water Enforcement will be developing guidance on best management pratices for control of toxic discharges from sludge and water waste disposal for the National Pollutant Discharge Elimination System (NPDES) permit authorities. The Office of Solid Waste will be developing, under RCRA authority, specific regulations dealing with any sludges that are hazardous. The Office of Water Planning and Standards will provide data support and formulate specific best management practice regulations for the control of residues in coordination with both the Office of Water Enforcement and the Office of Solid Waste.

In 1980, the Agency will collect and analyze the technological, economic, health, and general environmental factors as fundamental inputs to the development of specific regulations. To complete the revision of the existing BATEA limitation guidelines for the industries identified in the Act, EPA will continue to characterize effluents with respect to the 65 classes of priority pollutants and to evaluate the effectiveness of appropriate treatment technology in removing or reducing toxic pollutants concentrations. Technical, statistical, and economic support too will be provided to respond to litigation against promulgated BATEA regulations.

To initiate the best conventional pollutant control technology (BCT) regulations, new technical, economic, and statistical data bases must be compiled to allow determination of the necessity of revising existing BATEA regulations to meet the added test of economic reasonableness imposed by the Act for conventional pollutants. This effort will ensure that the most appropriate control mechanism for conventional pollutants has been established, that the required level of technology has been defined, and that applicable regulatory approaches will be selected from technically viable alternatives. Thorough economic impact analyses of affected industries will be conducted to assess the economic ramifications of alternative limitations, and, in particular, to assure that the ultimate regulation is economically achievable, fair, and equitable.

1978 Accomplishments

In 1978, $40.9 million was obligated including $37.9 million for contracts. The contract obligations include $28.3 million for toxic intensive technical studies, $5.5 million for economic impact and statistical support, analyses, $2.4 million for determination of health effects, and $1.7 million for analyses of environmental pollutant distributions and overall exposure and risks. To help meet the requirements of the Act, an additional $1.7 million was committed for technical contractual efforts to begin the following studies: seafood processing study; best management practices (BMP) for raw material storage and in plant spills; and the reasonableness of the best conventional pollution control technology (BCT) regulations.

- Promulgated general pretreatment guidelines that are the nationwide enforcement mechanisms for pretreatment standards, and that define the municipal, State and Federal responsibilities for administration and enforcement of the program. The promulgation also allows for partial exemption from the regulations for dischargers to publicly owned treatment works (POTW) that achieve large toxic pollutant reductions. These are the arrangements through which all regulations on direct discharge of toxic pollutants will be administered.

- Began a sampling and analysis project to determine levels of toxic pollutants discharged to and discharged by POTW through both effluent and sludges.

- Began a parallel project to determine relative levels of toxic pollutants discharged to POTW for general classes of sources.

- Conducted further work for development of analytical methods designed to detect toxic pollutants in various waste water media and sludges.

- Continued efforts to verify the capabilities of analytical methods to detect toxic pollutants in waste waters from various industrial categories.

- Initiated and continued technical studies to develop best available technology economically achievable (BATEA) effluent guidelines, new source performance standards (NSPS), pretreatment standards for existing sources (PSES), and pretreatment standards for new sources (PSNS) for 34 industries ascertained to be primary pollution problems. These technical efforts encompass investigation of several major aspects of each of the industrial categories. Information was compiled and analyzed to determine the processes and materials used, and the volume and concentrations of toxic pollutants in waste waters generated by those industries. Waste water treatment technologies having potential application in a given industrial category were examined with regard to performance in removing pollutants, engineering feasibility of the technology, space requirements, energy requirements, cost of installation, and operation and maintenance costs. These efforts were augmented by collection of field samples of industrial influent, raw effluent, and treated waste water for laboratory analysis. Resultant data is the fundamental technical evidence used to formulate regulatory options for and to defend promulgated standards.

- Initiated and continued economic studies for all 34 industry groups and all four types of regulations cited above. For each industry, economic analysis required review of all existing information of the financial and economic structure of the industry, development of models appropriate for assessing the economic status of the industry, and, in some cases, surveys of the plants in the industry. The economic information gathered and analyzed was used with treatment cost information to project economic ramifications of the respective regulations, including employment, production, and inflationary effects.

- Proposed pretreatment standards for existing sources in the electroplating point source category. Prior to proposal, the Agency examined impacts of dozens of different regulatory options, including the possible use of three levels of regulation, based on flow rates of process waste water. Each alternative was analyzed for cost to the industry, economic impact, and environmental benefit.

- After proposal, the Agency received and examined economic, environmental, and technical comments on the regulations and performed additional analyses, ranging from consideration of alternative economic assumptions to statistical and technical scrutiny of the removal capabilities of treatment systems.

- Proposed, promulgated, and amended best practicable technology (BPT), existing and new source performance and pretreatment standards for 10 industrial categories.

- Continued to prepare for and to respond to public comments on proposed regulations and court remands and lawsuits related to promulgated regulations. This work included reexamination of technical, economic and environmental data bases and, in some cases, performance of new analyses, or thorough review of analyses already preformed.

- Continued environmental studies of the geographic distribution of toxic pollutants and assessments of relative contributions to water pollution of various industrial categories. This was to identify areas requiring concentrated attention in the development of regulations and toxic pollutant control strategies.

- Provided statistical and computer support for planning and executing data collection efforts, analyzing resultant data, analyzing data on analytical methods and sampling activities, and numerical aspects of final regulation development.

- Initiated studies on best management practices (BMP) for raw material storage and in-plant spills for some industries. This tends to reduce the need for expensive treatment systems, and decreased the likelihood of accidental release of toxic pollutants into the environment.

- Proposed regulations setting the best conventional pollution control technology (BCT) for conventional pollutants in 13 secondary industrial categories. These regulations involved research on unit incremental removal costs (at BATEA treatment levels) for plants of various sizes in each of 93 industrial subcategories. These incremental costs of pollutant removal were compared to incremental costs for POTW treatment, to determine the reasonableness of setting BCT requirements at the old BATEA levels. For all 93 subcategories, BCT was either proposed to be set at existing BATEA levels, or suspended, pending further analysis.

1979 Program

In 1979, $24,427,000 and 95 positions have been allocated for this activity. Planned contracts of $16,640,000 include $11,700,000 for technical analytical studies; $2,200,000 for economic and statistical analysis: $540,000 for determiniation of health effects: $2,200,000 for analysis of environmental distributions of pollutants and exposure/risk. An additional $1,760,000 in extramural funds is included for analysis of toxics in publicly owned treatment works (POTW).

The principal planned accomplishments of the program are to:

- Begin actively to address and to incorporate substantive needs of other statutes, in particular the Resource Conservation and Recovery Act, into technical and economic studies to develop industrial effluent guidelines. Specifically engineering studies, field investigations, and economic analyses will compile information on sludge generation and disposal, and the handling of hazardous materials and other solid waste with regard to potential water pollution. These new efforts will supply appropriate data bases to allow for an integrated approach to regulation development.

of innovative and alternative treatment technologies, and recycling and reuse of wastewater that can be economically beneficial and mitigate negative environmental impacts.

- Collect and analyze for toxic pollutants influent and effluent samples of domestic waste waters in POTW as part of the Agency's multimedia POTW toxics control strategy; characterize the toxic removal capability of POTW, including an evaluation of sludge contamination; and using a projection of the industrial effluent burden upon POTW, analyze the content of combined sewer influents to POTW.

- Complete technical studies initiated in 1978 for 11 of the 34 primary industries and continue technical study of 23 industries. This work includes detailed laboratory analysis of effluent samples collected from plants in each subcategory of each industry, evaluation of the treatment performance of pollution abatement equipment currently used in each industry, engineering assessment of the applicability of treatment technologies not yet employed in the given industry, accounting for plant size variations, expansion space available, location, age, and production process. The technical studies further will address feasibility of process changes to recycle or reuse water. For each treatment option, process change, and alternative technology considered, the costs incurred by plants in the industry must be determined.

- Complete economic analyses of the potential impacts of each treatment alternative for 11 of the 34 primary industries and continue economic analyses of 23 industries. Because full economic impact information is required before a preferred treatment option is selected, each treatment alternative will be subjected to an economic analysis. These analyses will be successively more detailed as the range of options narrows; the final small group of options considered will be examined separately for impacts on prices, production, employment, industry size and concentration, foreign trade regional economics, the economics of related industries and capacity. A precursor to this step is the analysis of economic data on the industry to determine the economic and financial structure of model plants most appropriate for regulatory economic assessment of the industry. When necessary, economic impacts are determined according to several alternative economic organizational assumptions. Following final synthesis of technical economic and environmental studies, the Agency will promulgate or propose regulations for best available technology economically achievable (BATEA) effluent guidelines, new source performance standards (NSPS), pretreatment standards for existing sources (PSES), and pretreatment standards for new sources (PSNS) for 12 primary industries.

- Resolve issues raised through public comment on proposed regulations through further technical and economic analyses of data gathered prior to proposal.

- Conduct environmental studies, including geographical and quantitative industrial profiles, for an environmental risk assessment of 11 additional BATEA industires. This study involves extensive data gathering in each region of the Nation to determine the concentration of pollutants in the environment in those regions. This information will identify the regions and industries that require special attention because of the severity of their point pollution problems.

- Initiate measures to add substances to the Administrator's list of toxic pollutants, as required in Section 307(a) of the Clean Water Act, by developing a selection rational for choosing pollutants and by documentation of the human health and environmental effects of those pollutants.

- Initiate best conventional pollution control technology (BCT) studies for 11 of 34 primary industries. This requires examination of data on incremental cost of conventional pollutant removal by appropriately sized plants in each subcategory of each industry and POTW. These cost data will be systematically compared and analyzed for each alternative level of conventional pollutant treatment to conventional pollutants in each subcategory.

- Continue studies of industry best management practives (BMP) for raw material storage and handling, and control of in-plant spills. Appropriate BMP regulations ensure cost-effectiveness in pollutant control by reducing the required capacity of waste water treatment equipment. They also can reduce the likelihood of accidential pollution by other means of environmental contamination through sludge and other wastes disposal. The studies will require a thorough examination of inventory handling and production processes from an engineering and operations research perspective different from that necessary for development of effluent guidelines and pretreatment standards. Economic analyses of the implications of BMP regulations must be performed to determine the feasibility of BMP's in each industrial subcategory.

- Conduct economic analysis for support of Section 301(c) variances and all nonpoint source controls.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,623,800 results from several actions. A net increase of +$258,700 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of the Agency's ZBB review of priorities and changing resource requirements for its FY 1979 operating plan, -$289,300 was reprogrammed from this activity to spill prevention and responses. In addition, -$593,200 was functionally transferred to State program regulations and guidelines. This transfer does not affect the 1979 operating plan for this activity.

1980 Program

The 1980 request for this activity is for $29,111,000 and 113 positions. This includes $24,933,200 for contractual support to complete technical, economic and environmental studies and to propose and promulate best available technology economically achievable (BATEA) effluent guidelines, new source performance standards for existing sources (PSES), and pretreatment standards for new sources(PSNS), for the remaining primary industries. It also provides for additional analysis to respond to anticipated litigation and comments, assistance in preparation of court records, continuation of the development of regulations for best management practices (BMP), best conventional pollutant control technology (BCT) regulations for the remaining secondary and primary industries, and development of a preliminary POTW toxic pollutant regulatory strategy.

In 1980 the program will:

- Continue to incorporate needs of other statutes, in particular the Resource Conservation and Recovery Act, into technical and economic studies to develop industrial effluent guidelines. Specifically, information on sludge generation, stage, and disposal and the handling of hazardous materials and other solid wastes will have a major role in the final development and proposal of effluent guidelines regulations. This effort will reduce corporate and governmental administrative burdens in data collection and compliance. It too will result in an integrated approach to the issuance of permits.

- Incorporate into new regulations detailed consideration of innovative and alternative treatment technologies, and enhance recycling and reuse of water waste to reduce costs to industry and to enhance environmental benefits.

- Continue to investigate levels of toxic pollutants discharged to and by POTW through waste water and sludge. The results will guide the Agency's approaches to implementation of pretreatment programs, to sludge disposal or beneficial use, and to reexamination of standards for waste water discharges from POTW.

- Complete technical studies for 22 of the 34 primary industries. This work includes detailed laboratory analysis of effluent samples collected from plants in each subcategory of each industry, evaluation of the treatment performance of pollution abatement equipment currently used in each industry, accounting for variations in plant size, expansion space availability, location, age, and production process. The technical studies will also explore the feasibility of process changes to recycle or reuse water and the range of treatment technologies used in other industries that might apply to the industry under study. For each treatment option, process change, and alternative technology, the costs incurred by plants in the industry must be determined.

- Complete economic analyses of the potential impacts of each treatment alternative for 24 of the 34 primary industries. Because full economic impact information is required before a preferred treatment option is selected, each treatment alternative must be subjected to an economic analysis. These analyses must be successively more detailed as the number of options is reduced. This will culminate in the synthesis of environmental and technical work to propose regulations for best available technology economically achieveable (BATEA) effluent guidelines, new source performance standards (NSPS), pretreatment standards for existing sources (PSES), and pretreatment standards for new sources (PSNS) for as many as 22 primary industries in 1980.

- Between proposal and promulgation, all public comments must be examined and the issues raised must be resolved, often through additional technical and economic analyses of data gathered prior to proposal.

- Conduct environmental studies, including geographical and quantitative industrial profiles for an overall environmental risk assessment of 11 additional BAT industries. This study involves extensive data gathering in each region of the Nation to determine the concentration of pollutants in the environment in those regions. This information will identify the regions and industries that require special attention because of the severity of their point source pollution problems.

- Initiate further measures to add substances to the Administrator's list of toxic pollutants, as required in Section 307(a) of the Clean Water Act, by developing a selection rationale for choosing pollutants; and by documenting the human health and environmental effects of those pollutants.

- Initiate best conventional pollutant control technology (BCT) studies for 22 of the 34 primary industies. This requires examination of data on incremental cost of conventional pollutant removal to determine a reasonable level for treatment of conventional pollutants in each subcategory.

- Continue ongoing studies of industry best management practices (BMP) for raw material storage and handling, and control of in-plant spills. Incorporate BMP study results into industrial effluent guideline regulations where appropriate.

- Initiate technical support for implementation of the standards in National Pollutant Discharge Elimination System (NPDES) integrated permits. The individual plants in each industry will face different limitations, depending on their own process mixes and water use. For NPDES permit writing, methods will be developed to interpret each regulation or set of regulations applicable to each plant in the light of process waste water and sludge generation, waste treatment and waste stream combination within the plant. Recycle and reuse of waste waters as well as other innovative technologies will be major factors incorporated into permit writing procedures. Because of this and because of the many possibilities for chemical reaction and waste dilution within the plant, these methods will be based on a process and chemical engineering knowledge of the plant's production and discharge practices, and their relationship to the standards.

Abatement and Control

Grants Assistance Program

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Control Agency Resource Supplementation (Section 106).....	$53,484	$52,400	$52,400	$48,730	-$3,670
Areawide Waste Treatment Management Resources (Section 208).....	17,631	50,000	41,000	40,000	-1,000
Training Grants (Section 104).....	3,107	...	590	...	-590
Total.....	74,222	102,400	93,990	88,730	-5,260
Permanent Position.....	...	...	...	...	...
Full-time Equivalency.....	...	...	...	...	...

Budget Request

An appropriation of $88,730,000 is requested for 1980. This represents a decrease of $5,260,000 from the 1979 level for this subactivity and includes a decrease of $1,000,000 in the Section 208 areawide waste treatment management program resources, a shift of $3,670,000 from the Section 106 water pollution control agency grant program to the Agency's consolidated environmental grants program, and a reduction of $590,000 due to a nonrecurring 1979 congressional add-on for academic training.

Program Description

The water quality grants assistance program includes three grants assistance activities: water pollution control State program grants under Section 106, Section 208 planning grants, and Section 104 training grants.

The Act provides for financial support of State and designated areawide water quality planning and designation of management agencies under Section 208. This authority, combined with Sections 106 and 303 of the Act, provides the basis for control of nonpoint and point sources under the Act and calls for integration of water quality management programs. The Section 106 program provides Federal support to State and interstate water pollution control agencies in virtually all major water quality abatement and control and enforcement program areas.

In 1979, EPA introduced a major water quality management reform under Sections 208 and 106 of the Clean Water Act. The reform was aimed at integrating water quality and directly related grant assisted planning, implementation, and management of environmental programs, and particularly focused on improving EPA management of the Sections 208 and 106 grants programs. The mechanism for improving the Agency's management of these grant programs is the State/EPA agreement. The State/EPA agreements negotiated annually by individual States and EPA regions with the participation of affected local agencies and the public, will cover all strategies and work programs intended to integrate water quality and directly related program approaches funded under a number of EPA grant programs. Passage of pending consolidated grant legislation (for which $25 million is requested in 1980) would increase the potential funds available for priority State and local water quality related efforts.

The Section 106 program provides Federal support to 63 State and interstate water pollution control agencies. In every major 106 funded State program activity, EPA and the States jointly perform activities requiring extensive coordination to be effective. EPA regions will award Section 106 grants according to identified annual priorities for water pollution control activities and conduct periodic reviews of State accomplishments.

Section 208 grants are awarded to State and designated areawide planning agencies for continuing planning programs which address highest national, State, and local priorities. The Section 208 awards afford State and areawide agencies the unique opportunity to plan and manage a comprehensive water quality management program dealing with such problems as storm and combined sewer runoff, agricultural runoff, construction runoff, other nonpoint sources, and municipal and industrial waste water. In implementing a more comprehensive approach to water quality management, water quality, water supply and solid waste programs and related financial assistance may be used together to assist States and localities in addressing identified priority problems in an integrated, more cost effective way. Although Section 208 allows State and areawide agencies to evaluate all major sources of pollution within their jurisdiction, management of the water quality program in 1979 and 1980 is focused on identified priority problems.

Academic training grants are awarded to institutions of higher education to meet a variety of professional manpower needs. Efforts in this area are divided into three primary categories: the professional graduate training grant program, the State agency fellowship program, and undergraduate training grants.

CONTROL AGENCY RESOURCE SUPPLEMENTATION (SECTION 106)

1978 Accomplishments

In 1978, $53.5 million was obligated for Section 106 grants. State program activities and accomplishments in 1978 include:

- Continued support of priority program areas including permits, municipal facilities management, compliance and trend monitoring, enforcement, and planning related activities.
- Issuance, reissuance, or modification of over 1,300 major permits for primary industries and publicly owned treatment works (POTW).
- Over 11,000 compliance sampling and evaluation inspections conducted.
- State administration of more than $2.3 billion awarded in construction grants.

1979 Program

In 1979, $52,400,000 is allocated for Section 106 grants. As the States assume greater responsibilities in the management of the municipal construction program and qualify to receive Section 205(g) delegations and funding for this purpose, Section 106 funds will become available for emerging program priorities including, for example, additional delegations to States of responsibilities for dredge and fill permits, emergency response programs, toxics related activities, and nonpoint source regulatory programs. In addition, funding of traditional Section 106 program areas, with priority on permit issuance and compliance, will continue.

State program activities and outputs projected for 1979 include:

- Issuance, reissuance or modification of over 1,100 major permits for priority municipal and industrial facilities.
- Conduct over 11,500 compliance sampling and evaluation inspections, including toxics.
- Implement 140 municipal (POTW) pretreatment programs.

- Assure 3,700 State responses to emergency situations.

- Initiate over 650 enforcement actions against major pollution sources, including final effluent violations.

- Conduct 750 intensive water quality surveys.

- Establish 280 ambient fixed stations with data for Section 307(a) toxic compounds.

- Issue 180 State dredge and fill permits.

1979 Explanation of Changes from Budget Estimate

There is no change from the budget estimate.

1980 Plan

In 1980, $48,730,000 is requested for Section 106 grant allocations. Beginning in 1980, to the maximum extent feasible, a new Section 106 funding allocation will be developed and initially implemented, based upon priority State and national needs identified in national policy and State/EPA agreements.

Additional State delegations and funding of municipal construction management responsibilities under Section 205(g) are expected to allow further shift of 106 and State funding to support emerging priority programs. Traditional State activities, including monitoring, permits, compliance assurance, and municipal construction program management (where delegations have not been made), will continue to receive Section 106 support as determined by the State/EPA agreements.

A formal consolidated grants program would also provide an opportunity for increasing funding of high priority State water quality programs.

Planned 1980 State program activities and accomplishments in 1980 include:

- Issuance, reissuance or modification of nearly 1,000 major permits for priority municipal and industrial facilities.

- Conduct over 10,500 compliance sampling and evaluation inspections, including toxics.

- Implement 100 municipal publicly owned treatment works (POTW) pretreatment programs.

- Assure 2,700 State responses to emergency situations.

- Initiate over 600 enforcement activities against major pollution sources, including final effluent violations.

- Conduct 650 intensive water quality surveys.

- Establish 230 ambient fixed stations with data for Section 307(a) toxic compounds.

- Issue 130 State dredge and fill permits.

AREAWIDE WASTE TREATMENT MANAGEMENT

1978 Accomplishments

In 1978, $17.6 million was allocated for Section 208 grants. Limited additional funding was made available to successful areawide agencies to develop water quality recommendations for the control of national and State/local priority problems not covered by initial grants. States became increasingly involved through the certification process in the coordination of the areawide planning process. A long-term funding and management strategy was developed together with policies aimed at the integration of Clean Water Act programs. Five-year priorities for Section 208 planning were established, giving high priority to agricultural runoff based on needs, likelihood of implementation, relative impact on water quality, and other factors.

Policy defining the relationship between Sections 208 and 201 funding of municipal facilities planning was established, placing a limited requirement for Section 208 funding in determining the need for AWT municipal facilities, pretreatment programs and alternative municipal waste treatment approaches.

Likelihood of implementation has been established as a condition for continuing funding and the relationship of Section 208 planning activities to other water pollution related programs has been established and clarified.

Development of Agency policy on ground water management and urban storm runoff has accelerated during 1978. Additional 1978 water quality management program accomplishments are described in detail under the State program regulations and guidelines section.

1979 Program

In 1979, $41,000,000 is allocated for Section 208 grants. At the start of 1979, 54 initial areawide plans had been certified and 12 plans had been approved by EPA. States and EPA will have completed review and approval of essentially all initial plans by the middle of 1979. Approximately 200 continuing planning awards will be made, emphasizing urban runoff, agriculture, water conservation, AWT and pretreatment, to successful agencies with funds targeted to planning projects with high priorities established by national policy and 1979 State/EPA agreements. It is expected that most previously funded agencies will qualify for 1979 grant support. However, some will receive funding through the States rather than in the form of direct grants. A few new areawide agency designations are projected for 1979. Improved integration of planning and management requirements under Sections 208, 201, 106, and 303 is being strongly emphasized.

Projected 1979 water quality management program outputs are described in detail under the State program regulations and guidelines section.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$9,000,000 results from several actions. First, the Congress reduced this activity by -$18,000,000. Secondly, funds available for the program were increased by +$11,000,000 due to the payback of funds "borrowed" in 1978 and approved by the Appropriations Subcommittees, from municipal waste treatment facilities construction ($5,000,000), emission standards and technology assessment within the air media ($3,000,000) and radiation abatement and control activities ($3,000,000). Finally, -$2,000,000 was transferred to other Agency activities to support the cost of the most recent pay raise.

1980 Plan

In 1980, $40,000,000 is requested for Section 208 grants allocation. Successful agencies will be funded to perform continued planning only in nonpoint sources priority areas, including irrigated and nonirrigated agriculture, ground water protection, water conservation, hydrologic modification, feedlots, noncoal mining, construction runoff, silviculture, and urban storm runoff. Selection of projects for

funding will be governed by selection criteria used in 1979 funding. In addition, beginning in 1980, unless some significant portion of completed planning is being implemented, continuing funding will not be provided. A continuing level of more than 200 funded State and areawide agencies will be maintained during 1980.

In past years, Section 208 funds and, to a limited extent, Section 201 funds were available for pretreatment planning. Advanced waste treatment planning related to facilities was funded under Section 201. The water quality analyses and waste load allocations were funded under Sections 106 and 208. Beginning in 1980, these activities will be funded entirely by Section 201, allowing the Section 208 appropriation to be devoted to nonpoint sources of pollution. The above activities to be funded by Section 201 funds will be performed by State areawide planning agencies through the State/EPA agreement process.

Increasingly comprehensive State/EPA agreements covering Resource Conservation and Recovery Act (RCRA) and Safe Drinking Water Act (SDWA) programs will be established in all regions and States. Additional 1980 water quality management activities and outputs are described under the State program regulations and guidelines section.

Highlights of these outputs include:

- Selection, funding and implementation of up to 20 prototype urban runoff control projects.

- Contingent upon Department of Agriculture (USDA) appropriations, up to 40 agricultural nonpoint source cost sharing programs under the Rural Clean Water Program will be implemented.

- Continuation of seven model implementation programs (MIP) and 5-10 additional agricultural water quality demonstration projects will be developed and funded in coordination with USDA.

- Public participation activities among WQM agencies, planning consultants, business and industry associations, public interest organizations, agricultural and professional associations and urban groups.

TRAINING GRANTS

1978 Accomplishments

In 1978, $3.1 million was expended under this program. The professional training grant program provided $370,000 for training graduate level students in water related engineering and environmental sciences. In 1978, 93 graduate trainees were supported at 29 institutions. The State agency fellowship program provided $350,000 for 101 State employees from 31 State and territorial water pollution control agencies. They were selected to spend one-year in a water related graduate or undergraduate program. Upon completion of this training, the employees returned to their respective agencies.

Professional training activities for 1978 included $100,000 for continuation of curriculum development. The Bachelor of Engineering Technology program is being developed at Clemson University, the University of Maryland, and Pennsylvania State University. Undergraduate training grants were provided for five institutions in water related engineering and environmental disciplines to support approximately 86 students for $120,000.

1979 Program

In 1979, $590,000 is being provided to support trainees, including graduate training programs at $125,000, undergraduate training programs at $65,000, and State agency fellowships at $175,000. Also, $175,000 is provided for the Manpower Report to Congress and the Engineering Co-op Student Demonstration Project.

The training grants provide funding support primarily for tuition, fees, and stipends for students enrolled in water quality control technology curricula.

1979 Explanation of Changes from Budget Estimate

The net increase of +$590,000 results from a congressional add-on for academic training.

1980 Plan

There will be no program in 1980.

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Research and Development:					
Appropriation.....	$21,270	$23,470	$23,462	$27,752	+$4,290
Permanent Positions.....	120	112	111	95	-16
Full-time Equivalency...	...	...	149	121	-28
Abatement and Control:					
Appropriation.....	41,655	49,287	40,231	48,230	+7,999
Permanent Positions.....	107	170	170	160	-10
Full-time Equivalency...	...	...	251	253	+2
Enforcement:					
Appropriation.....	16,447	20,816	19.608	15,583	-4,025
Permanent Positions.....	186	208	217	227	+10
Full-time Equivalency...	...	...	242	261	+19
Agency and Regional Management:					
Appropriation.....	81,954	84,263	90,503	95,858	+5,355
Permanent Positions.....	1,936	1,941	1,981	2,059	+78
Full-time Equivalency...	...	...	2,625	2,693	+68
Total, Management and Support Program:					
Appropriation.....	161,326	177,836	173,804	187,423	+13,619
Permanent Positions.....	2,349	2,431	2,479	2,541	+62
Full-time Equivalency...	...	...	3,267	3,328	+61
Outlays.....	157,539	160,980	181,880	178,210	-3,670
Authorized Levels.....	19,000*	*	24,060*	*	

* Funds are currently authorized under the Environmental Research, Development, and Demonstration Authorization Act of 1979; this authorization is pending for 1980. Remaining funds are authorized by virtue of the Appropriation Act.

OVERVIEW AND STRATEGY

This media encompasses overall program direction and related management activities carried out by the following program offices: Office of Water and Waste Management; Office of Air, Noise, and Radiation; Office of Toxic Substances; Office of Enforcement; and Office of Research and Development. The management functions covered include development of program policies and strategies, planning of media activities, and monitoring and review of program performance. Also included in the Enforcement appropriation is the Office of General Counsel (headquarters) and the Office of Regional Counsel located within each of the 10 regions.

The agency and regional management portion of this media provides executive direction, management,and support for all EPA programs at both the headquarters and the 10 regional offices. It involves those activities which are not directly associated with a given programmatic activity. Agency and regional management activities are personnel related and, as such, include the salaries and related expenses of the Administrator and the Regional Administrators, their immediate staffs and the staff offices which report directly to them. In addition, it includes those organizations within the Agency which provide centralized management and administrative services. These centralized management activities include program planning and evaluation, economic analysis, budgeting and financial management, personnel, contracts and grants management, audit, and other activities required for the effective management of

This media also covers the costs of agencywide support services which are allocated to each of the four appropriations listed above, as well as certain program support costs which are charged directly to the Abatement and Control and Research and Development appropriations. These costs consist of a wide assortment of other-than-personnel costs, such as office and laboratory services, building operations and maintenance, communications, facilities lease costs, and centralized ADP services. In most instances, these services cannot be directly attributed to a specific organization or program. For this reason, the total costs under this category are allocated on a prorata basis and charged to the four Agency "operating program" appropriations. The share of these support costs which is prorated to the four appropriations is included under each appropriation listed above but will be discussed fully under the Agency support and regional support subactivities for purposes of clarity.

The scope of these management and support activities is determined by the programs they serve. As a result, the increases shown under this media are confined to high priority needs or to mandatory increases.

SUMMARY OF INCREASES AND DECREASES

	(in thousands of dollars)
1979 Management and Support Program.....	$173,804
Research and Development..... This increase is primarily to cover additional costs associated with both direct and prorated support services and ADP support, offset by a decrease resulting from a transfer of the Science Advisory Board activity to the Agency and Regional Management appropriation.	+4,290
Abatement and Control..... This net increase related primarily to increased charges for both direct and prorated support services and ADP support, and provides additional contract support for management studies and alternative approaches to implementing TSCA for the Office of Toxic Substances.	+7,999
Enforcement..... This decrease is due primarily to an adjustment in the proration formula for agencywide support services and to nonrecurring legal information contracts.	-4,025
Agency and Regional Management..... This increase is primarily to cover additional costs associated with prorated support services and ADP support and the transfer of the Science Advisory Board from the Research and Development appropriation, offset by Agency management decreases due to nonrecurring contracts, administrative services, and training activities.	+5,355
1980 Management and Support Program.....	187,423

1. Summary of Budget Request

An appropriation of $187,423,000 is requested in 1980. This request, by appropriation account, is as follows:

Research and Development.....	$27,752,000
Abatement and Control.....	48,230,000
Enforcement.....	15,583,000
Agency and Regional Management.....	95,858,000

This represents an increase of $13,619,000 over the 1979 management and support media. This change reflects increases in management support and personnel costs for the Office of Toxic Substances; an increase in staff for the Office of Regional Counsel; an increase for agencywide support services prorated to all four appropriations covered under this media; additional direct support costs for laboratories operated by the Offices of Research and Development; Air, Noise, and Radiation; and Toxic Substances; an increase in ADP support services; and decreases in agency management activities.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.....	$177,836
Congressional reduction in lapse rate.....	-225
Distribution of October 1977 pay raise.....	-12,725
Effect of October 1978 pay raise.....	+279
Proposed October 1978 pay raise supplemental.	+2,401
Transfer to Department of Labor.....	-899
Reprogramming actions.....	+7,137
Current 1979 estimate.....	173,804

Congressional changes result from the $3 million reduction to the Abatement and Control and Enforcement appropriations to the lapse rate on filling of positions; this reduction to management and support activities amounted to $225,000.

Pay raise costs result in a total decrease of $10,045,000 from the original estimate. The Agency request included all funds for the October 1977 pay raise in this media to be distributed to other media at a later date. The decrease reflected represents this later distribution to other media.

The transfer of contract compliance activities to the Department of Labor is reflected by the decrease of $899,000.

Reprogramming actions result in a net increase of $7,137,000 to the management and support media and include a transfer to the interdisciplinary media ($418,000); from the radiation media ($13,000); from the water quality media ($3,745,000); from the solid waste media ($4,247,000); to the air media ($617,000); from the toxic substances media ($524,000); from the drinking water media ($1,420,000); to the pesticides media ($1,777,000).

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations	$161,326	$183,207
Effect of October 1978 pay raise	+2,800	...
Transfer to Department of Labor	-899	...
Program increase	+9,500	+6,700
Effect of reprogramming	+7,101	...
Change in amount of carryover funds available	-1,375	-9,403
Change in rate of obligations	+4,754	+6,902
Total estimated obligations	183,207	187,406
(From new obligation authority)	(172,659)	(186,261)
(From prior year funds)	(10,548)	(1,145)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $2.8 million. The contract compliance transfer will reduce obligations by $899,000.

The increase in 1979 budget authority over the 1978 level will increase obligations by $9.5 million. In 1980, the increase in budget authority will result in an increase to obligations of $6.7 million.

Reprogramming actions are expected to increase obligations by $7 million.

The amount of carryover funds to be obligated in 1979 is $10,548,000 a decrease of $1,375,000 over the 1978 level. In 1980, it is estimated that $1,145,000 will be obligated, a decrease of $9,403,000.

A change in the rate of obligation is expected to occur in 1979, increasing obligations by $4,754,000.

A change in the rate of obligation is expected to occur in 1980, increasing obligations by $6.9 million.

Research and Development

Program Management

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Appropriation.....	$6,441	$8,529	$5,233	$4,596	-$637
Permanent Positions.....	120	112	111	95	-16
Full-time Equivalency.....	...	...	149	121	-28

Budget Request

An appropriation of $4,596,000 is requested for 1980. This is a decrease of $636,500 from the 1979 level. The decrease in this account is primarily due to the transfer of the Science Advisory Board staff to the Agency management activity, partially offset by an increase for additional research grants for the continuing Minority Institution Research Support program.

Program Description

The program management activities associated with the Agency's research and development program include the overall direction and centralized management of the Office of Research and Development. It covers the salaries and other expenses of the Assistant Administrator for Research and Development and his principal deputies, their immediate staffs, and specialized staff groups which assist them. It also covers the costs of research grants for the Minority Institution Research Support program. In 1979 and prior years, the Agency's Science Advisory Board is included in this account. In 1980, this Board, which provides scientific advice to the Administrator, is reflected under the Agency and Regional Management appropriation within the Agency management activity. The resources associated with these activities are as follows:

	1979		1980		Change	
	Pos.	$(000)	Pos.	$(000)	Pos.	$(000)
Office of Research and Development, program management.....	95	$4,397	95	$4,596	...	+$199
Science Advisory Board.....	16	836	...	...	-16	-836
Total.....	111	5,233	95	4,596	-16	-637

1979 Explanation of Changes from Budget Estimate

The net decrease of -$3,296,500 results from several actions. An increase of +$405,400 results from increased pay costs from the October 1989 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. The increase in pay costs for employees in this activity is offset by the transfer and distribution of -$3,600,000 included in the budget estimate for this activity for research and development pay costs. In addition, -$101,900 was reprogrammed within this media from this activity to research and development program support to cover increased agencywide common services costs.

Program Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation.....	$14,829	$14,941	$18,229	$23,156	+$4,927
Permanent Positions.....	...	...	...	...	...
Full-time Equivalency....	...	...	...	...	...

Budget Request

An appropriation of $23,156,000 is requested for 1980. This represents an increase of $4,927,000 from the 1979 level and will provide for increased agencywide support costs, ADP support services, and support costs at the Office of Research and Development laboratories.

Program Description

This subactivity covers the overhead services needed to support the research and development effort. Two types of support costs are included. The first consists of the share of the cost of agencywide support services which are prorated to the Research and Development appropriation. These costs include common services provided to programs located in Washington, D.C.; Research Triangle Park, North Carolina; and Cincinnati, Ohio; as well as certain agencywide charges such as facilities lease costs, communications, and centralized ADP services. The second type of cost includes support services which are directly incurred in connection with the operation of the Office of Research and Development's laboratories. These direct costs consist mainly of laboratory and office services, utilities, building maintenance and similar "housekeeping" costs at research and development installations other than those located at Research Triangle Park and Cincinnati. The estimated cost of program support services are as follows:

	1979	1980	Change
	(dollars in thousands)		
Prorated costs and ADP services.....	$14,987	$18,819	+$3,832
Direct charges.....	3,242	4,337	+1,095
Total.....	18,229	23,156	+4,927

The increase in prorated charges covers the increased cost of agencywide common services. These increases are discussed in detail under this media within the Agency support subactivity under the Agency and Regional Management appropriation. The increase in direct charges relates to projected cost increases for utilities, building operations, laboratory services and housekeeping activities at Office of Research and Development laboratories.

1979 Explanation of Changes from Budget Estimate

The net increase of +$3,288,200 results from several actions. A Presidential Determination Order transferred personnel and related costs for contract compliance activities from EPA to the Department of Labor; of the $1,401,000 transferred by this action, -$27,000 was applicable to this activity. During the development of the Agency's 1979 operating plan, +$3,732,900 was reprogrammed from research and development program management ($101,900), from an allocation of Research Triangle Park computer center costs to research and development ($2,169,100), and from savings in ADP support ($1,461,900). Finally, -$417,700 was reprogrammed to technical information in the interdisciplinary media.

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
Appropriation						
Program Management.....	$5,549	$13,640	$7,001	$6,938	-$63	MS-9
Program Support.....	36,106	35,647	33,230	41,292	+8,062	MS-10
Total.....	41,655	49,287	40,231	48,230	+7,999	
Permanent Positions						
Program Management.....	107	170	170	160	-10	
Program Support.....	...	...	...	...	...	
Total.....	107	170	170	160	-10	
Full-time Equivalency						
Program Management.....	...	...	251	253	+2	
Program Support.....	...	...	...	...	...	
Total.....	...	...	251	253	+2	

Purpose

This activity covers the centralized program direction and management functions for the following EPA offices: Water and Waste Management; Air, Noise and Radiation; and Toxic Substances. It also covers the prorata share of agencywide support services which are prorated to the Abatement and Control appropriation as well as those program support costs incurred directly at field installations managed by the Office of Air, Noise and Radiation and the Office of Toxic Substances.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation.....	$5,549	$13,640	$7,001	$6,938	-$63
Permanent Positions.....	107	170	170	160	-10
Full-time Equivalency.....	...	...	251	253	+2

Budget Request

An appropriation of $6,938,000 and 160 positions is requested for 1980. This represents a net decrease of $63,000 and 10 positions from the 1979 level and reflects a net change in the staff and contract support of the Office of Air, Noise and Radiation and the Office of Water and Waste Management.

Program Description

This subactivity provides for the overall program direction and management activities of the Offices of Air, Noise and Radiation; Water and Waste Management; and Toxic Substances. The resources shown above cover the salaries and other expenses for Assistant Administrators who head each of these offices, their immediate staffs, and the management and other specialized staff groups which assist them. These resources also provide for the Deputy Assistant Administrators who direct the specific programs carried out within each of these offices together with their supporting staffs. The resources associated with each of these offices are as follows:

	1979		1980		Change	
	Pos.	$(000)	Pos.	$(000)	Pos.	$(000)
Office of Air, Noise and Radiation.....	57	$2,345	55	$2,000	-2	-$345
Office of Water and Waste Management.....	53	2,690	48	2,121	-5	-569
Office of Toxic Substances.....	60	1,966	57	2,817	-3	+851
Total.....	170	7,001	160	6,938	-10	-63

The decrease of 10 positions within this subactivity reflects the shift of staff from management functions to higher priority programmatic activities. The slight decrease in funding reflects the increase in the Office of Toxic Substances which is due to additional contract support and the annualized costs for new staff added in 1979. The additional contract support will provide for management studies of more effective program integration between TSCA and FIFRA, as well as policy analyses of alternative approaches to implementing TSCA. The offsetting decreases are related to reductions in staff and contract support for the Office of Air, Noise and Radiation and the Office of Water and Waste Management.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$6,638,800 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$109,600. An increase of $462,700 results from increased pay costs from the October 1978 (FY1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. This increase is offset by the transfer and distribution of -$7,300,000 for Abatement and Control pay raise costs to the applicable activities. In addition, as a result of the Agency's review of resource requirements for its 1979 operating plan, +$308,100 was reprogrammed to this activity from radiation technology and environmental assessment ($12,600) and from program support activities ($295,500).

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation.....	$36,106	$35,647	$33,230	$41,292	+$8,062
Permanent Positions.....	...	...	...	...	...
Full-time Equivalency.....	...	...	...	...	...

Budget Request

An appropriation of $41,292,000 is requested for 1980. This represents an increase of $8,062,000 over 1979 and provides for increased agencywide support costs, ADP support services, and support costs at the Ann Arbor, Montgomery, and Durham field installations.

Program Description

This subactivity covers a variety of overhead services needed to support the program activities funded under the Abatement and Control appropriation. Two types of support costs are included. The first consists of the share of the cost of agencywide support services which are prorated to this appropriation for support provided to abatement and control programs located at EPA headquarters; Research Triangle Park (RTP), North Carolina; Cincinnati, Ohio; and in the 10 regional offices. These costs cover office and building services, utilities, communications, supplies, equipment, facilities lease costs, centralized ADP services, and the like. The second type of costs includes the support costs for the facilities operated by the Office of Air, Noise and Radiation and the Office of Toxic Substances. These include costs such as building operations and maintenance, utilities, local telephone service, supplies, equipment, etc., and are charged directly to the Abatement and Control appropriation. The estimated costs of these two categories of support services are as follows:

	1979	1980	Change
	(dollars in thousands)		
Prorated costs and ADP services.....	$31,987	$39,867	+$7,880
Direct charges.....	1,243	1,425	+182
Total.....	33,230	41,292	+8,062

The increase in prorated charges covers the increased cost of agencywide common services. These increases are discussed in detail under this media within the Agency support subactivity under the Agency and Regional Management appropriation. The increase in direct charges reflects expected increases in the cost of utilities and similar charges for field installations at Ann Arbor, Michigan; Montgomery, Alabama; and Durham, N.C.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$2,417,000 results from several actions. First, a Presidential Determination Order transferred personnel and related costs for contract compliance activities from EPA to the Department of Labor; of the $1,401,000 transferred by this action, -$195,000 was applicable to this activity. Second, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, as well as changes in the proration of agency support and ADP cost savings, -$6,900,800 was transferred from this activity to Agency management activities ($1,696,500), to program management ($295,500), to pesticides activities ($1,777,500), to air activities ($676,600), and to water quality activities ($2,454,700) and +$4,678,800 was reprogrammed to this activity from Agency support ($78,200), from RTP computer center costs ($1,565,400), from Agency support ($761,500), from hazardous waste guidelines, regulations, and policies ($1,294,400), from air quality and emissions data analysis ($111,000), and from regional municipal waste treatment facilities construction ($868,300).

Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs 1979	Page
			(dollars in thousands)			
Appropriation						
Program Management.....	$5,970	$9,378	$7,774	$7,561	-$213	MS-12
Program Support.....	10,477	11,438	11,834	8,022	-3,812	MS-13
Total.....	16,447	20,816	19,608	15,583	-4,025	
Permanent Positions						
Program Management.....	186	208	217	227	+10	
Program Support.....	...	...	...	...	...	
Total.....	186	208	217	227	+10	
Full-time Equivalency						
Program Management.....	...	...	242	261	+19	
Program Support.....	...	...	...	...	...	
Total.....	...	...	242	261	+19	

Purpose

This activity provides for the overall program direction and management of the Office of Enforcement. It also covers the salaries and related expenses for the headquarters Office of General Counsel and the Office of Regional Counsel in the Agency's 10 regional offices as well as the prorata share of agencywide support costs which are allocated to the Enforcement appropriation.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation.....	$5,970	$9,378	$7,774	$7,561	-$213
Permanent Positions.....	186	208	217	227	+10
Full-time Equivalency.....	...	...	242	261	+19

Budget Request

An appropriation of $7,561,000 and 227 positions is requested for 1980. This represents a decrease of $213,000 due to nonrecurring contracts and an increase of 10 positions over the 1979 level for the Office of Regional Counsel.

Program Description

This subactivity provides for the overall direction of the Office of Enforcement and national enforcement programs for all media. Activities performed under this subactivity include strategy development, penalty policy implementation, program planning, and management support. The salaries and other expenses of the assistant Administrator for Enforcement, his immediate staff, and management and other specialized staffs are covered under this subactivity. It also provides for the salaries and other expenses of the Office of General Counsel which provides legal advice and assistance to the Administrator and other Agency components and for the Offices of Regional Counsel which provide similar services within each of the 10 regional offices. The resources under this subactivity are allocated as follows:

	1979		1980		Change	
	Pos.	$(000)	Pos.	$(000)	Pos.	$(000)
Office of Enforcement.....	37	$1,343	37	$1,232	...	-$111
Office of General/Regional Counsel	180	6,431	190	6,329	+10	-102
Total.....	217	7,774	227	7,561	+10	-213

The 10 position increase requested for the Office of Regional Counsel will provide the additional staffing required to handle workload increases due primarily to construction grant awards, revised State NPDES programs, new SIPs, and the permit programs under RCRA and the Safe Drinking Water Act. This increase is offset by a decrease attributed mainly to nonrecurring contracts awarded in 1979 for the development of legal information systems.

1979 Explanation of Changes to Budget Estimate

The net decrease of -$1,604,400 results from several actions. First, Congress applied a $3 million reduction for position lapse rate to the Abatement and Control and Enforcement appropriations; -$115,600 was applied to this activity. Second, an increase of +$587,500 is due to increased pay costs associated with the October 1978 (FY 1979) pay raise and distribution of the October 1977 (FY 1978) pay raise. Third, the increase for pay costs is offset by the transfer and distribution among other enforcement activities of -$2,600,000 which was included in the budget estimate for enforcement pay raise costs. Fourth, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$523,700 was reprogrammed to this activity to strengthen overall Office of Enforcement program management and planning, including litigation management and penalty policy implementation ($264,500) and to expand General/Regional Counsel activities ($259,200), due to a reduction in toxic substances enforcement.

Program Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation.....	$10,477	$11,438	$11,834	$8,022	-$3,812
Permanent Positions.....	...	...	...	...	...
Full-time Equivalency.....	...	...	...	...	...

Budget Request

An appropriation of $8,022,000 is requested for 1980. This represents a decrease of $3,812,000 from the 1979 level and represents a change in the percentage of costs prorated for the agencywide support accounts.

Program Description

This subactivity covers the Enforcement appropriation's share of costs allocated for support services provided to enforcement programs located at EPA headquarters and in the 10 regional offices. These costs, which cover office and building services, utilities, communications, centralized ADP services, facilities lease costs, etc., are discussed in detail under this media within the Agency support subactivity under the Agency and Regional Management appropriation. The decrease shown above results from an adjustment in the formula used to prorate these costs to the several EPA appropriations.

1979 Explanation of Changes from Budget Estimate

The net increase of +$396,500 results from several actions. A Presidential Determination Order transferred personnel and related costs for contract compliance activities from EPA to the Department of Labor; -$79,000 was applicable to this activity. In addition, +$475,500 was reprogrammed to this activity from ADP support ($207,900) and from municipal waste treatment facilities construction ($267,600).

Agency and Regional Management

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
		(dollars in thousands)				
Appropriation						
Agency Management.....	$53,070	$52,893	$59,717	$59,198	-$519	MS-15
Agency Support.....	13,302	17,150	9,854	14,624	+4,770	MS-19
Regional Management.....	14,606	13,293	19,867	19,690	-177	MS-22
Regional Support.....	976	927	1,065	2,346	+1,281	MS-24
Total.....	81,954	84,263	90,503	95,858	+5,355	
Permanent Positions						
Agency Management.....	1,349	1,382	1,385	1,382	-3	
Agency Support.....	...	...	...	...	...	
Regional Management.....	587	559	596	677	+81	
Regional Support.....	...	...	...	...	...	
Total.....	1,936	1,941	1,981	2,059	+78	
Full-time Equivalency						
Agency Management.....	...	...	1,868	1,886	+18	
Agency Support.....	...	...	...	...	...	
Regional Management.....	...	...	757	807	+50	
Regional Support.....	...	...	...	...	...	
Total.....	...	...	2,625	2,693	+68	

Purpose

The agency and regional management portion of this media provides executive direction, management and support for all EPA programs at both the headquarters and the 10 regional offices. It involves those activities which are not directly associated with a given programmatic activity. Agency and regional management activities are personnel related and, as such, include the salaries and related expenses of the Administrator and the Regional Administrators, their immediate staffs and the staff offices which report directly to them. In addition, it includes those organizations within the Agency which provide centralized management and administrative services. These centralized management activities include program planning and evaluation, economic analysis, budgeting and financial management, personnel, contracts and grants management, audit, and other activities required for the effective management of Agency programs. The full cost of these program direction and managerial activities is charged to the Agency and Regional Management appropriation.

Support services consist of a wide assortment of other-than-personnel costs, such as office and laboratory services, building operations and maintenance, communications, facilities lease costs, and centralized ADP services. In most instances, these services cannot be directly attributed to a specific organization or program. For this reason, the total costs under this category are allocated on a prorata basis and charged to the four Agency "operating program" appropriations.

Agency Management

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation.....	$53,070	$52,893	$59,717	$59,198	-$519
Permanent Positions.....	1,349	1,382	1,385	1,382	-3
Full-time Equivalency.....	...	...	1,868	1,886	+18

Budget Request

An appropriation of $59,198,000 is requested for 1980. This represents a decrease of $519,000 and three positions from the 1979 level.

Program Description

The Agency management subactivity provides for agencywide policy direction and management activities and includes the salaries and associated costs for the immediate office of the Administrator, the staff offices which report directly to the Administrator, and the Office of Planning and Management.

OFFICE OF THE ADMINISTRATOR/STAFF OFFICES

The Office of the Administrator includes the Administrator and Deputy Administrator and their immediate staffs. The Administrator/Deputy Administrator are responsible for providing policy direction to the Agency and for insuring the implementation of these policies. The staff offices perform a variety of functions which are closely related to the development and implementation of Agency policies and programs. These staff groups are responsible for legislative services and congressional relations, public awareness, international activities, civil rights, liaison with other Federal agencies, coordination of regional operations and relations with State and local governments. The Office of Administrative Law Judges is also attached to the Office of the Administrator. In 1980, the Agency's Science Advisory Board is included under this appropriation; it was included in the Research and Development appropriation in 1979 and previous years. The Board consists of a number of expert consultants, supported by a small staff. It provides expert advice to the Administrator on scientific and technical issues.

The 1980 request provides for a net decrease of five positions and $47,000 for the Office of the Administrator and the staff offices. This decrease, which is summarized below, reflects the transfer of the Science Advisory Board to this account, as well as a two position increase in the Office of Civil Rights which is needed for the development and coordination of the President's Minority Business Enterprise program. The decreases in the other staff offices reflect the transfer of resources to higher priority activities elsewhere in the Agency.

Office of Legislation	37	1,148	36	1,049	-1	-99
Office of Public Awareness	61	3,137	52	2,964	-9	-173
Office of International Activities	26	1,217	24	1,116	-2	-101
Office of Civil Rights	28	1,038	30	1,088	+2	+50
Office of Federal Activities	43	1,632	41	1,500	-2	-132
Office of Regional and Intergovernmental Operations	9	503	7	434	-2	-69
Administrative Law Judges	18	687	17	629	-1	-58
Science Advisory Board	*	*	15	780	+15	+780
Total	271	11,594	266	11,547	-5	-47
Full-time Equivalency	348	...	355	...	+7	...

*Carried under Research and Development appropriation.

The significant contracts for the staff offices in 1979 and 1980 are listed below:

Office	1979	1980	Change	Purpose
	(dollars in thousands)			
Office of the Administrator	$178	$125	-$53	Contract studies on policy and scientific issues of direct interest to the Administrator.
Office of Public Awareness	1,197	1,197	...	Production and distribution of information/educational material, including publications, films, T.V. and radio announcements; Visitor's Center maintenance; and press office support.
Office of Regional and Intergovernmental Operations	50	50	...	Contracts for seminars on environmental programs with public interest groups and national organizations representing elected officials of State and local governments.

OFFICE OF PLANNING AND MANAGEMENT

The Office of Planning and Management (OPM) is responsible for the agencywide analytical and management functions which are required to plan and implement the Agency's programs. It also provides centralized Agency administrative services for EPA headquarters and the Agency's two largest field installations, which are located at Research Triangle Park, N.C., and at Cincinnati, Ohio. There are five organizational components within the Office of Planning and Management (OPM). The immediate office of the Assistant Administrator provides the direction of all OPM activities and also carries out the Agency's Occupational Health and Safety Program. The Office of Management and Agency Services develops agencywide policies and procedures and provides services in the areas of personnel administration, contracts management, data systems, facilities management and services, security and inspection, and management planning and analysis. The Office of Resources Management is responsible for the Agency's program analysis, budgeting, financial management, and grants administration activities.

Office of Audit plans and conducts the Agency's comprehensive audit program, which involves independent appraisals of the economy and efficiency of the Agency's programs and financial operations.

The 1980 request for the Office of Planning and Management provides for a net increase of two positions together with a decrease of $472,000. The increase in staffing reflects the need for six additional positions for the Office of Management and Agency Services and seven positions in the Office of Planning and Evaluation which are partially offset by decreases in the immediate office of the Assistant Administrator and the Office of Resources Management. The additional staff for the Office of Management and Agency Services is needed to handle the increased workload associated with the implementation of the recently enacted civil service reform legislation and to provide effective administrative services for staff being added in the headquarters in 1979. The seven positions for the Office of Planning and Evaluation will permit that office to expand its economic and other analytical capabilities to address regulatory reform implementation and to perform energy economic analysis and analyses of new economic incentive programs. The decrease in funding can be associated with nonrecurring costs for administrative services and employee training activities.

The resources associated with the Office of Planning and Management are as follows:

	1979		1980		Change	
	Pos.	$(000)	Pos.	$(000)	Pos.	$(000)
Office of the Assistant Administrator.....	29	$1,113	27	$1,128	-2	+$15
Office of Management and Agency Services..	647	22,148	653	21,661	+6	-487
Office of Resources Management.....	247	8,414	238	8,414	-9	...
Office of Planning and Evaluation.....	81	7,686	88	7,686	+7	...
Office of Audit.....	110	8,762	110	8,762	...	...
Total.....	1,114	48,123	1,116	47,651	+2	-472
Full-time Equivalency.....	1,520	...	1,531	...	+11	...

The major contracts for the Office of Planning and Management for 1979 and 1980 are summarized below:

Office	1979	1980	Change	Purpose
	(dollars in thousands)			
Office of Management and Agency Services.....	$704	$217	-$487	Executive development and supervisory training, specialized computer support, and other miscellaneous administrative services.
Office of Resources Management.	$1,382	$1,382	...	Contract assistance for the development and implementation of agencywide ZBB system contract studies related to disaster response requirements; ADP support for accounting, program reporting, and grants information systems; and payroll services.

Evaluation.....	$4,661	$4,661	...	Contracts to assess the economic impact of EPA regulations on major industries, the energy impact of environmental regulations, environmental impact of energy legislation as well as the performance of statistical studies.
Office of Audit.....	3,595	3,595	...	Contracts with CPA firms and State agencies for the conduct of construction grants audits.

1979 Explanation of Changes from Budget Estimate

The net increase of $6,823,600 results from several actions. An increase of $4,317,700 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. This increase is offset by the distribution of the $3.3 million included in the budget estimate for increased Agency and Regional Management pay costs. Reorganization Plan No. 1 of 1978 transferred personnel and related costs for contract compliance activities from EPA to the Department of Labor; of the $1,401,000 transferred by this action, $56,300 was applicable to this activity. Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan as opposed to the budget estimate developed one-year earlier, $5,862,200 was reprogrammed to this activity from abatement and control activities in the solid waste (+$2,536,100), program support ($1,696,500), and drinking water (+$1,213,500) medias and from research and development activities in the drinking water(+$206,500) and solid waste (+$209,600) medias.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation.....	$13,302	$17,150	$9,854	$14,624	+$4,770
Permanent Positions.....	...	...	...	...	...
Full-time Equivalency.....	...	...	...	...	...

Budget Request

A prorata share of $14,624,000 of the total agency support requirements is requested for 1980. This represents an increase of $4,770,000 over the 1979 level.

Program Description

The Agency support subactivity provides general support services to all program operations at EPA headquarters; Research Triangle Park (RTP), North Carolina; and Cincinnati, Ohio. It also includes a number of support activities which serve the needs of all agency programs and which are managed at the headquarters level. The agency support subactivity can be summarized in terms of the following major areas of cost:

Office Services -- Common services requirements at the three locations referred to above including laboratory and office supplies, maintenance of office equipment, printing and duplicating, audio-visual equipment and contracts, motor pool operations, etc.

Building Services -- Utilities, local telephone service, building alterations and space relocations, building maintenance contracts, guard and janitorial service, employee health service contracts, and the like for the office and laboratory facilities at the three locations.

Library Services -- Books, journals, equipment, and service contracts for the branch libraries at headquarters, Research Triangle Park, and Cincinnati, as well as specialized ADP services, literature searches, technical reports processing library systems development, etc., for the agencywide library system.

Nationwide Costs -- All Agency costs for the following support activities: facilities rental and associated costs; payments to the U.S. Postal Service; Federal telecommunications service (FTS), security investigations; reimbursements to the Federal Employees Compensation Fund; payments to the Public Health Service for personnel administration services for commissioned officers assigned to EPA; and contracts which support the Agency's Occupational Health and Safety Program.

ADP Technical Support -- Contracts for systems development/evaluation and other technical services required to support the Agency's centralized ADP activities.

ADP Timesharing Services -- Centralized ADP services provided to all Agency programs through timesharing contracts with commercial suppliers or by in-house computer facilities.

Agency support costs are distributed to the various EPA appropriations according to their personnel levels and the amount requested above reflects only that portion of the total support costs which are prorated to the Agency and Regional Management appropriation. However, in order to provide a more complete explanation of the total scope of the

	(in thousands of dollars)		
Office Services	$3,086	$3,607	+$521
Building Services	8,869	12,522	+3,653
Library Services	941	1,043	+102
Nationwide Costs	29,662	34,815	+5,153
ADP Technical Support	2,275	3,585	+1,310
ADP Timesharing	16,690	19,190	+2,500
Total	61,523	74,762	+13,239

The requested increase of $521,000 for office services will provide for expected increases in the cost of printing and duplicating, expendible office supplies, equipment maintenance, motor vehicle operations, and audio-visual services.

The $3,653,000 increase for building services is associated with anticipated cost increases for utilities, local telephone services, equipment rental and for contracts for building operations and maintenance and guard service.

The $102,000 increase requested for library services will cover increases in the cost of library materials and support contracts as well as acquisition of some additional materials which are required for the toxics program.

Of the $5,153,000 increase requested for nationwide costs, $2,741,000 can be associated with the 1980 annualized costs of additional space which is being leased to accomodate additional Agency personnel authorized in 1978 and 1979 or to replace existing leased space which is inadequate for program purposes. The remaining amount is required to cover needed modifications to existing leased space and for expected increases for postal and Federal telecommunications services.

Of the increase of $1,310,000 requested for ADP technical support activities, $510,000 is needed for studies relating to the development of new data systems or the refinement of existing systems, development of software for the minicomputers which are becoming more widely used within the Agency, and for improvements in communications between computers and data management systems. These systems improvements, in combination, have the longer range potential for reducing the Agency's overall timesharing requirements. The remaining amount will be used for feasibility studies associated with planning for the procurement of equipment which will meet the Agency's need for ADP services in the period through 1990.

The requested increase of $2,500,000 for ADP timesharing services will cover the additional need for data systems which support the public water supply and ground water protection programs under the Safe Drinking Water Act and those which relate to RCRA regulations. It also covers the implementation of a system of common codes to be used by the Federal agencies concerned with the regulation of chemicals, the data needs for health research initiatives, and the expanded management information systems required for the Agency's zero based budgeting (ZBB) contracts and personnel management activities.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$7,295,300 results from several actions. To support the additional costs of the most recent pay raise, $1 million was reprogrammed from ADP savings to other activities agencywide. Reorganization Plan No. 1 of 1978 transferred

agency and regional management ADP savings, -$1,047,000 was reprogrammed from this activity to abatement and control agency support ($839,700) and enforcement agency support ($207,900). An additional $32,400 was reprogrammed to abatement and control ADP support costs. The transfer and proration of RTP computer center costs plus savings resulted in a reduction of -$5,164,000 which was reprogrammed to research and development support ($1,350,000), to research and development ADP support ($2,169,100), and to abatement and control ADP support ($1,644,000). With the exception of the $1 million used for pay raise absorption and the $51,300 transferred to the Department of Labor, all transfers were within the management and support media and represent an adjustment to the prorata/user's shares.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation.....	$14,606	$13,293	$19,867	$19,690	-$177
Permanent Positions.....	587	559	596	677	+81
Full-time Equivalency.....	...	...	757	807	+50

Budget Request

An appropriation of $19,690,000 is requested for 1980. This represents a decrease of $177,000 from the 1979 level.

Program Description

This subactivity provides for the salaries and related expenses of the Regional Administrators, their immediate staffs, and those staff offices reporting directly to them, such as intergovernmental relations, public affairs, and civil rights. In addition, it covers the regions' centralized management activities such as program planning and analysis, budgeting, financial management, and personnel management and administrative services.

In 1980, an increase of 81 positions is requested for regional program direction and management activities. Twenty-nine of these positions will be used for program direction and related staff activities. This reflects the emphasis which the Agency is placing on achieving greater public participation in regulatory activities, strengthening relations between the regional offices and State/local governments; and implementing the President's Minority Business Enterprise program as it relates to the construction grants program.

Sixteen of the additional positions will be used to improve the regions' analytic capabilities by establishing Regional Project Centers. These Centers, the first of which will be established in 1979, will bring a core group to the regions with a high degree of analytic and management skills. These core groups will focus on crosscutting issues and will provide the skills needed to allow the regions to participate more effectively in agencywide efforts toward regulatory and management reform and in the integration of Federal, State, and local programs. This new analytical capacity will assist the Regional Administrators in developing integrated strategies for stronger State environmental programs in each region and in addressing difficult problems requiring analytical and project management skills (e.g., State/RA agreements, regional energy problems, economic development issues, etc.). The additional positions requested in 1980 will allow Centers to be established in two additional regions.

The remaining 36 positions will enable the regions to strengthen their existing services in the areas of personnel management and administrative services to more effectively handle the workload resulting from the expansion of regional programs which has occured over the past several years, and to implement recently enacted civil service reforms.

The cost of this additional staffing for the regional offices management activities is more than offset by reductions in nonrecurring costs associated with the procurement of minicomputers and other ADP equipment, and in contracts such as those for the development of innovative methods for implementing the Minority Business Enterprise effort.

$1,982,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Reorganization Plan No. 1 of 1978 transferred personnel and related costs for contract compliance activities from EPA to the Department of Labor; of the $1,401,000 transferred by this action, $466,200 was applicable to this activity. In addition, a net of $916,700 was transferred into this activity within the regional offices to reflect actual operating conditions as of the end of 1978. The transfer includes +$712,300 from abatement and control water quality; municipal waste treatment facility construction ($651,300); manpower planning and training ($61,000); and +$204,400 from water quality enforcement permit issuance. Finally, as a result of regional offices' review of priorities and changing resource requirements for its 1979 operating plans, as opposed to its budget estimates developed one year earlier, $4,243,600 was reprogrammed to this activity , including $207,200 from solid waste abatement and control/technical assistance delivery, $3,803,000 from water quality abatement and control/municipal waste treatment facilities construction ($3,075,000) and manpower planning and training ($727,400), $182,200 from water quality enforcement permit issuance, and $51,300 from ambient air quality monitoring.

Regional Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation.....	$976	$927	$1,065	$2,346	+$1,281
Permanent Positions.....	...	...	...	...	...
Full-time Equivalency.....	...	...	...	...	...

Budget Request

A prorata share of $2,346,000 of the total regional support requirements is requested for 1980. This represents an increase of $1,281,000 over the 1979 level.

Program Description

This subactivity covers the costs of common services for the Agency and Regional Management appropriation within all of the regional offices. These services include, but are not limited to, office supplies and equipment, telephone service, and guard and housekeeping services. As in the case of agency support, the total cost of the support services required by the regional offices is prorated to the various EPA appropriations, as follows:

	1979	1980	Change
	(dollars in thousands)		
Abatement and Control.....	$4,761	$4,275	-$486
Enforcement.....	2,380	2,296	-84
Agency and Regional Management.....	1,065	2,346	+1,281
Total.....	8,206	8,917	+711

The changes in the funds requested for 1980 are due to a change in the regional distribution of positions by appropriation and to the increased costs of the regional support services described above.

1979 Explanation of Changes from Budget Estimate

The net increase of $137,900 results from several actions. Reorganizaton Plan No. 1 of 1978 transferred personnel and related costs for contract compliance activities from EPA to the Department of Labor; of the $1,401,000 transferred by this action, $24,200 was applicable to this activity. Additionally, as a result of regional office reviews of changing resource requirements for 1979 operating plans, as compared to budget estimates developed one year earlier, $162,100 was reprogrammed to this activity from municipal waste treatment facilities construction activities within the water quality media.

Buildings and Facilities

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Buildings and Facilities:					
Appropriation.....	$2,424	$2,563	$1,063	$1,425	+$362
Permanent Positions....	...	...	...	...	...
Full-time Equivalency..	...	...	...	...	...
Outlays.....	1,274	2,000	1,800	2,000	+200
Authorization Level....	Authorization is by virtue of the Appropriation Act				

OVERVIEW AND STRATEGY

This appropriation covers design and construction of all new EPA owned facilities as well as necessary repairs and improvements to all federally owned facilities which are occupied by EPA.

The Agency has no plans for significant additions or expansions to its facilities through 1980. Rather, emphasis will be given to maintaining or replacing existing structures at the 23 separate Federal installations which EPA owns or occupies. As has been the case over the past several years, primary attention will be given to projects which are required to protect the health and safety of EPA employees, provide more effective pollution control, or prevent costly deterioration to structures and equipment. Projects which are needed for improved program operations or for other purposes have been assigned lower priority.

The Agency's 1980 budget request departs from that of previous years in that budgeting for a number of projects is on a "phased" basis. Under this approach, design funds for some projects are being requested in 1980, while requests for actual construction funding will be deferred to subsequent years. This will enable EPA to move ahead with a number of priority projects while at the same time limiting the 1980 request to reduce the relatively large unobligated balances previously associated with this appropriation.

SUMMARY OF INCREASES AND DECREASES

	(in thousands of dollars)
1979 Buildings and Facilities Program.....	$1,063
Increase related to proposed construction projects which are needed to protect the health and safety of EPA employees, effect pollution control, and limit property deterioration.....	+362
1980 Buildings and Facilities Program.....	1,425

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An appropriation of $1,425,000 is requested for the Buildings and Facilities account, an increase of $362,000 over 1979. Of the total amount requested, $1,375,000 will be used for repairs and improvements to existing facilities, and $50,000 for the design of a shop and storage building at the Environmental Research Laboratory at Gulf Breeze, Florida.

	(in thousands of dollars)
Original 1979 estimate.....	$2,563
Congressional reduction.....	-1,500
Current 1979 estimate.....	1,063

The Congress applied a reduction of $1.5 million to the Buildings and Facilities budget request.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations.....	$2,424	$2,140
Program increase.....	+1,063	+362
Change in amount of carryover funds available.....	-1,347	-1,077
Total estimated obligations.....	2,140	1,425
(From new obligation authority).....	(1,063)	(1,425)
(From prior year funds).....	(1,077)	...

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The increase of 1979 budget authority over the 1978 level will increase obligations by $1,063,000. The change in 1980 will increase obligations by $362,000.

The amount of carryover funds to be obligated in 1979 is $1,077,000, a decrease of $1,347,000 from the 1978 level. In 1980, no carryover funds are expected to be available, thereby reducing obligations by $1,077,000.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Repairs and Improvements..	$2,382	$2,063	$563	$1,375	+$812
New Facilities.....	42	500	500	50	-450
Total.....	2,424	2,563	1,063	1,425	+362
Permanent Positions.....	...	...	...	...	...
Full-time Equivalency.....	...	...	...	...	...

Budget Request

An appropriation of $1,425,000 is requested in 1980, representing an increase of $362,000 over the 1979 level.

Program Description

The appropriation covers the design and construction of new EPA owned facilities as well as necessary repairs and improvements to federally owned installations which are occupied by EPA. Payments made for modifications and repairs to leased facilities are covered under the agency support subactivity which is described under the management and support media.

REPAIRS AND IMPROVEMENTS

1978 Accomplishments

Thirty-three repair and improvement projects to correct health and safety conditions, effect pollution control, or maintain property have been completed or are underway. The estimated cost to complete these projects is $2,912,000.

1979 Program

Work on 10 projects at eight separate locations will be initiated in 1979. These projects, which have a total estimated cost of $563,000, are needed to correct health and safety deficiencies or to prevent serious deterioration to structures. They include hazardous materials storage areas and disposal systems, modifications to ventilating systems, fencing, and a specialized laboratory for handling carcinogens.

1979 Explanation of Changes to Budget Estimate

The reduction of $1.5 million from the budget request reflects the congressional reduction applied to this appropriation.

1980 Plan

Work will be initiated on a total of 44 separate projects at 16 locations. Of these projects, 18 will involve actual construction while the remainder will cover the design work on projects for which construction funds will be requested in subsequent years. The projects planned for 1980 include:

Location	Project Description	Amount
Narragansett, R.I.	Lab Entrance Design	$3,000
	Security Lighting	4,500
	Meter Interlock	2,500
	Pump Replacement	26,500

Beltsville, Md.	Lab Mods (Bldg. 306)	100,000
	Carcinogen Storage Construction	75,000
Vint Hill, Va.	Pollution Abatement Design	3,000
Bears Bluff, S.C.	Water Supply System Design	5,000
Athens, Ga.	Replace Cooling Tower Roof	4,000
Gulf Breeze, Fla.	Sprinkler System Design	15,000
Montgomery, Ala.	Fume Hood/Scrubber System	35,000
Bay St. Louis, Miss.	Fume Hood System Design	10,000
Chicago, Ill.	Containment Lab Design	3,000
Duluth, Minn.	Pollution Abatement Design	65,000
Ada, Okla.	Carcinogen Storage Design	15,000
Denver, Col.	Fire Suppression Design	4,000
Corvallis, Ore.	Safety Mods Design	20,000
	HVAC Construction	420,000
Wenatchee, Wash.	Sanitary Sewer Design	2,000
Manchester, Wash.	Water Supply System Design	6,000
Edison, N.J.	Sanitary Sewer System	150,000
	Water Supply System Design	20,000
	Heating System Design	50,000
	Electrical System Mod. Design	20,000
	Security Fencing Design	8,000
	Sprinkler System Mods.	12,000
Gulf Breeze, Fla.	Relocate/Renovate Bldg. 34	60,000
	Renovate Bldg. 7 Design	2,000
	Remove Bldg. 25/26	4,000
Cincinnati, Ohio	Concrete Pavement Repairs	33,000
	Roof Repairs	8,000
Duluth, Minn.	Storage/Paint Shop Design	3,000
Grosse Ile, Mich.	Lab Waste Drain Lines	5,000
	Design to Upgrade for Labs	30,000
Ada, Okla.	Air Conditioner Equipment Design	30,000
Denver, Col.	Egress Mod Design	5,000
	HVAC Mod Design	24,000
Corvallis, Ore.	Electrical Service Mods	15,000
Wenatchee, Wash.	Security Fence	2,000
Manchester, Wash.	Access Road Design	6,000
	Bldg. 60-Mod Design	3,000
	Pier Repair Completion	35,000
	Total.....	1,375,000

A contract was awarded in November 1977 for the construction of the central regional laboratory for Region X. This facility, which is located at Manchester, Washington, is scheduled for completion in the spring of 1979. Design work was also initiated in August 1978 on a laboratory building located at the Environment Research Laboratory at Gulf Breeze, Florida, which will house high hazard studies of toxic materials related to energy production and use and industrial effluents. This building is the first phase of a 3-phase program aimed at replacing existing frame structures at the Gulf Breeze installation which are unsafe for high hazard operations and which cannot be economically upgraded. This first replacement laboratory is now scheduled for completion in the apring of 1980; its total estimated cost is $500,000.

1979 Program

Contracts will be awarded for the design and construction of the second phase of the Gulf Breeze replacement program. The building to be constructed will be a laboratory to house studies on the physical and chemical degradation of pesticides and other toxic chemicals, many of which are carcinogenic. This structure also has an estimated cost of $500,000; its projected completion date is the fall of 1980.

1980 Plan

Funds are being requested to initiate the third phase of the Gulf Breeze replacement program. This will involve the design of a building to house shop and storage areas and electric switch-gear equipment. The structures now being used for these purposes are frame buildings which are badly deteriorated and which present a fire hazard when used for shop and storage activities. The estimated cost of this design work is $50,000. Funds for construction, now estimated at approximately $450,000, will be requested in 1981.

Scientific Activities Overseas

SCIENTIFIC ACTIVITIES OVERSEAS

PROGRAM HIGHLIGHTS

	1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Scientific Activities Overseas:					
Appropriation.....	$2,220	$4,000	$2,500	$4,000	+$1,500
Permanent Positions...	...	...	...	...	...
Full-Time Equivalency.	...	...	...	...	...
Outlays.....	1,422	5,000	2,500	3,600	+1,100
Authorization Levels..	Authorization is by virtue of the Appropriation Act.				

OVERVIEW AND STRATEGY

Scientific Activities Overseas (SAO) programs are funded from excess foreign currencies accruing to the United States under various U.S. programs. The use of these currencies in Egypt, India, and Pakistan enables EPA to engage in unique environmental research programs which form a link between EPA and foreign agencies and institutions that have mutual interests in seeking solutions to environmental problems. The cooperative activities are designed to supplement and/or complement EPA's domestic goals and frequently fill the gaps in EPA's research and demonstration programs.

The SAO activities cover a broad spectrum of environmental concerns in air and water pollution, energy, radiation, solid waste management, pesticides, and toxic substances. These activities are undertaken by foreign investigators in leading institutions abroad, with the cooperation of EPA scientists and engineers and consultants from U.S. industries and universities. Cooperative projects initiated include those dealing with the determination of potential hazards to human health of certain toxic substances; studies of the management and disposal of hazardous industrial and municipal waste discharges; determination of the fate and effects of fresh water, coastal, and ocean disposal of waste materials; analysis, assessment, and control methodology for toxic discharges from fertilizer and basic organic chemical industries; environmental effects of persistence and degradation of pesticides and toxic residue. Other studies examined irrigation by waste water and related health effects; impacts of fugitive and stack emissions, and comparative pollution impacts on urban/rural communities; correlation between the effects of air pollution load and urban/rural communities; and, land use management including attempts to characterize land resources, evaluate these resources, and implement a land-use plan.

Project related activities include workshops on topics such as reclamation of strip mined lands and environmental effects of pesticides. These workshops provide a forum for exchange of technology among U.S. and foreign experts in the subject areas, prospective participants in the SAO program, and representatives from universities and industries.

The SAO review procedure for approving projects closely parallels the procedures for EPA domestic programs. Proposals are initiated by institutions in the participating countries after informal communications have identified mutual research interests. Scientific evaluations are made of each proposal by appropriation EPA scientists and engineers. Industrial and university consultants are frequently requested to provide technical comments. Official approval of each project is made with the concurrence of the responsible EPA program office, the EPA Office of International Activities, and the Department of State.

In addition to the scientific and technological benefits obtained from the interrelationship of U.S. and foreign scientists and engineers, the SAO program stimulates environmental protection activities in the participating countries. Without exception, these countries have significantly increased their mechanisms to deal with environmental problems. A most recent example of this occurred in India where a central office was established within the Department of Science and Technology to manage SAO cooperative programs.

Furthermore, the SAO programs are recognized in the U.S. and in all participating countries as visible evidence of U.S. efforts to engage in peaceful endeavors directed toward the development of knowledge and technological advancement to benefit our global environment.

SUMMARY OF INCREASES AND DECREASES	(dollars in thousands)
1979 Scientific Activities Overseas Program.....	$2,500
Increase relates to additional support for Egypt and Pakistan.....	+1,500
1980 Scientific Activities Overseas Program.....	4,000

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An appropriation of $4 million is requested for the Scientific Activities Overseas activity.

2. Changes from Original 1979 Budget Estimate

The decrease of $1.5 million was made by the Congress.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations.....	$2,220	$5,377
Program increase.....	...	+1,500
Change in amount of carryover funds available.....	+1,841	-2,877
Change in rate of obligation.....	+1,316	...
Total estimated obligations.....	5,377	4,000
(From new obligation authority).....	(2,500)	(4,000)
(From prior year funds).....	(2,877)	(...)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The increase in budget authority requested in 1980 is expected to increase obligations by $1.5 million.

The amount of carryover funds to be obligated in 1979 is $2,877,000, an increase of $1,841,000 over the 1978 level. In 1980, no carryover funds are expected to be available, thereby reducing obligations by $2,877,000.

A change in the rate of obligation is expected in 1979, which would result in an increase of $1,316,000 to obligations.

SCIENTIFIC ACTIVITIES OVERSEAS

(Special Foreign Currency Program)

	1978 ~~Actual 1980~~	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Program Levels					
SAO Projects.....	4	10	5	10	+5
Technology Transfer Seminars.	1	2	1	2	+1
Appropriation					
Egypt.....	$2,061	$2,500	$1,500	$2,500	+$1,000
Pakistan.....	143	500	...	500	+500
India.....	16	1,000	1,000	1,000	...
Total.....	2,220	4,000	2,500	4,000	+1,500

Budget Request

An appropriation of $4 million is requested in 1980, representing a $1.5 million increase over the 1979 level.

1978 Accomplishments

- Obtained final reports on projects initiated approximately three years ago in Poland. These reports are being published through the EPA and in U.S. scientific journals. Research results shown in the reports are useful to the EPA, environmental decision makers, regulatory officials, and the public and private sectors.

- Initiated four new projects--three were started in Egypt, one in Pakistan.

- Participated in the U.S./Indian Binational Workshop on Environmental Pollution. This workshop, sponsored by the Indian Department of Science and Technology, represented a significant breakthrough in the development of cooperative programs. EPA team members and representatives from Indian governmental offices, research laboratories, universities, and industries identified 10 projects dealing with air pollution, health and ecological effects, and water pollution.

- Held workshop in Poland on environmental aspects of open pit mining in follow-up to the highly successful seminar held in the U.S. in 1976.

- Participated in Science and Technology Subcommission meetings relating to SAO programs in Egypt and India. These meetings provide a forum for setting research priorities that are compatible with environmental interests of EPA and the participating countries.

1979 Program

Intensive efforts were made to capitalize on unique control data on health and environmental effects, collect data needed under EPA's legislation on industrial chemical control, and improve EPA's ability to measure the effects of human and environmental exposure to commercial chemicals. New programs addressing innovative multi-media treatment control technology, and limited development and demonstration of waste management practices applicable to specific U.S. conditions were initiated. An increased capability to evaluate the effects of pollutants on human health was gained, along with new knowledge of health and ecological effects of pollutants in fresh water, coastal, and marine ecosystems. In Egypt, and important study on desertification was begun that will produce a valuable end product for Egypt, the United States, and other countries where there is a growing concern for this ecological problem.

New programs in the participating countries included studies on the safe application of waste waters, development of waste water management strategies, and research on new control technologies for water as well as for particular industries; studies on toxicity, including the effects of selected commercial chemicals on human health, testing procedures, and tracing the fate of heavy metals and toxic substances in water systems; and finally, the development of sampling techniques for the determination of organic emissions from various processing plants.

An EPA-Indian workshop will be held in the U.S. as a follow-up to the 1978 workshop held in India. The workshop will examine and disseminate the accomplishments of the 1978 workshop projects, as well as identify future projects of mutual interest in monitoring, evaluation, prevention, and control of environmental pollutants.

1979 Explanation of Changes from Budget Estimate

The decrease of $1.5 million from the budget estimate reflects a congressional reduction to the appropriation request.

1980 Plan

In 1980, $4 million is requested for the Scientific Activities Overseas program, an increase of $1.5 million over the 1979 level. The overall goals of the 1980 program will relate directly to environmental problem areas of concern to the EPA, including: studies to provide increased capability to evaluate the environmental impact of chemicals, increased activity in the development of waste management technology and in improving capabilities for reuse of limited water resources, the gathering of primary data on health consequences of the use of toxic substances, the collection of data on oil pollution to permit better clean-up practices, the development of new technology to further reduce the level of industrial air pollution, and the demonstration of best available technology for pollution control.

EGYPT ($2.5 million)

The U.S./Egyptian Joint Commission on Science and Technology gives priority to environmental programs and provides a mechanism for establishing overall U.S./Egyptian priorities for SAO program funding. EPA active participation in the Commission meetings provides a stimulus for planning environmental studies. In addition to specific projects, seminars are planned to disseminate the results of ongoing and completed projects, including: health hazards of certain toxic substances, management and disposal of hazardous industrial and municipal waste discharges, and the fate and effects of fresh water, coastal, and ocean disposal of waste materials.

Areas of importance emerging from the 1978-1979 Water Qualities Studies of the River Nile/Lake Nasser are being pursued, including such studies as the use and disposal of industrial waste water; and the fate of fresh water, coastal, and marine disposal of such waste water. Other ongoing projects include studies on the spread of enteric pathogens from land application of waste water; development of air pollution controls in the cotton industry; and health effects of air pollutants in heavy traffic areas.

In 1980, specific activities will include:

- Determination of potential hazards to human health of certain toxic substances.
- Studies of the management and disposal of hazardous industrial and municipal waste discharges.
- Determination of the fate and effects of fresh water, coastal, and ocean disposal of waste materials.
- Environmental effects of persistence and degradation of pesticides and toxic residue.
- Investigations of the fate and ecological effects of oil and derived hydrocarbons.

INDIA ($1 million)

U.S. and Indian environmental resources identified during the EPA/India Workshop held in 1978 were brought together through cooperative planning mechanisms developed during the Workshop. SAO projects are being given added support under the aegis of the U.S./India Joint Commission on Science and Technology which meets annually to determine broad areas of cooperation and to stimulate cooperative activities.

The proposed 1979 U.S./Indian Binational Workshop points toward increasing interest in identifying new areas of study. Areas of mutual interest under continuing study include the establishment of human and environmental effects of exposure to toxic substances; development of sampling techniques for organic emissions from processing plants, development of waste water management strategy and research on new technologies for the treatment and control of waste water, and a comparison of the fate of toxic substances in fresh water and marine ecosystems. Seminars will be held to disseminate the results of these projects.

Activities will include:

- Studies of environmental health effects associated with the reuse of waste waters for irrigation.
- Analysis, assessment,and control methodology development for the toxic discharges from fertilizer, coke oven, and basic chemical industries.
- Correlation of health effects of air pollution in urban-rural communities.
- Studies of fugitive and stack emission impact on air quality.

PAKISTAN ($500,000)

The SAO program in Pakistan is supported through the environmental division within the Ministry of Production, Environment and Urban Affairs. The organizations and universities identified by the Ministry as having resources to support SAO programs have prepared several projects for SAO funding. The studies involve highly trained professional and technical talent and give promise of producing data that would be useful to the control and abatement of pollutants. In addition, seminars are planned to discuss municipal and industrial waste water treatment and reuse, and identify further Pakistani research areas of concern to the U.S. and Pakistan.

Ongoing studies include investigations of by-product recovery from industrial waste waters, an assessment of waste waters in small plants, and studies on low cost control technologies for industrial and trade wastes.

U.S Regulatory Council

REGULATORY COUNCIL

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Regulatory Council					
Appropriation.....	...	...	...	$3,238	+$3,238
Permanent Positions..	...	...	...	10	+10
Full-time Equivalency	...	...	...	16	+16
Outlays.....	...	...	...	2,600	+2,600

OVERVIEW AND STRATEGY

This appropriation covers the salaries and expenses of the Regulatory Council and its supporting staff. The Council, established in October 1978 at the direction of the President, is composed of the heads of those agencies within the Executive Branch which have regulatory responsibilities. Its purpose is to maintain an overview of Federal regulatory activities and to assist the President in managing them in a coordinated manner so as to limit their adverse impacts on the Nation's economy. The departments and agencies whose heads serve as members of the Council are the Department of Treasury; Justice; Agriculture; Commerce; Interior; Labor; Health, Education and Welfare; Housing and Urban Development; Transportation; Energy; General Services Administration; Environmental Protection Agency; Veteran's Administration; Equal Employment Opportunity Commission; National Credit Union Administration; and the Administrative Conference of the United States. The independent regulatory commissions will also be invited to join the council.

The Council will report directly to the President; however, for administrative convenience, its 1980 budget request is included with EPA's overall budget submission.

SUMMARY OF INCREASES AND DECREASES

	(in thousands of dollars)
1979 Regulatory Council Program.....	...
This increase will provide for the salaries and other expenses of the Regulatory Council.....	+$3,238
1980 Regulatory Council Program.....	3,238

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An appropriation of $3,238,000 is requested to provide for staff salaries, related expenses, contracts, and grants and cooperative agreements for the Regulatory Council.

2. Changes from Original 1979 Budget Estimates

No appropriation was requested for the Regulatory Council in 1979.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Estimate 1980 (in thousands of dollars)
Prior year obligations.....	...
1980 program increase.....	+$3,238
Total estimated obligations.....	3,238
(From new obligation authority).....	(3,238)
(From prior year funds).....	...

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The 1980 program increase results in an estimated obligation of $3,238,000

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Regulatory Council...	...	...	...	$3,238	+$3,238
Permanent Positions					
Regulatory Council...	...	...	...	10	+10
Full-time Equivalency					
Regulatory Council...	...	...	...	16	+16

Budget Request

An appropriation of $3,238,000 is requested for 1980, representing the entire increase over 1979.

Program Description

The Regulatory Council has been established to provide the President with a complete picture of the regulations development efforts of the various agencies under his direct control and to help him manage the cumulative and cross-cutting effects of regulatory activities. The Council will be assisted by a small staff which will work in areas such as the following:

Calendar Development - This will involve developing and maintaining a consolidated calendar of all major significant regulatory actions proposed by the member agencies. This calendar will help make it possible to identify the interrelationships among planned regulations and to develop coordinated plans for dealing with regulatory issues which are common to several agencies.

Development of Improved Techniques for Decision Making - The Council's staff will take the lead in developing improved decision making tools for regulatory application. This will be done by adapting methods already used in the more sophisticated agencies for use by the less experienced agencies. Among the techniques to be considered are marginal cost analysis, consistent risk assessment approaches, and improved benefits analysis.

Special Projects - The staff will also undertake a number of special projects aimed at resolving specific regulatory problems. These will range from the development of common policies affecting a number of agencies to analyses of the combined impacts of current and/or combined regulations on selected hard-hit industries.

Liaison - A substantial amount of effort will be assigned to maintaining liaison with interests groups and the public over the effects of various regulations and the ways in which the Administration is attempting to cope with regulatory problems and reform.

The Council's staff will consist of a mix of professionals trained in law, economics, and the sciences supported by research assistants and clerical personnel. Because of the small size of its staff, the Council will place heavy reliance on contracts, grants, and cooperative agreements, examples of which are described below:

Project	1980 Costs (dollars in thousands)	Purpose
Development of Decision Making Tools.....	$650	Economics and statistically oriented studies aimed at demonstrating the use of advanced regulatory decision making techniques.

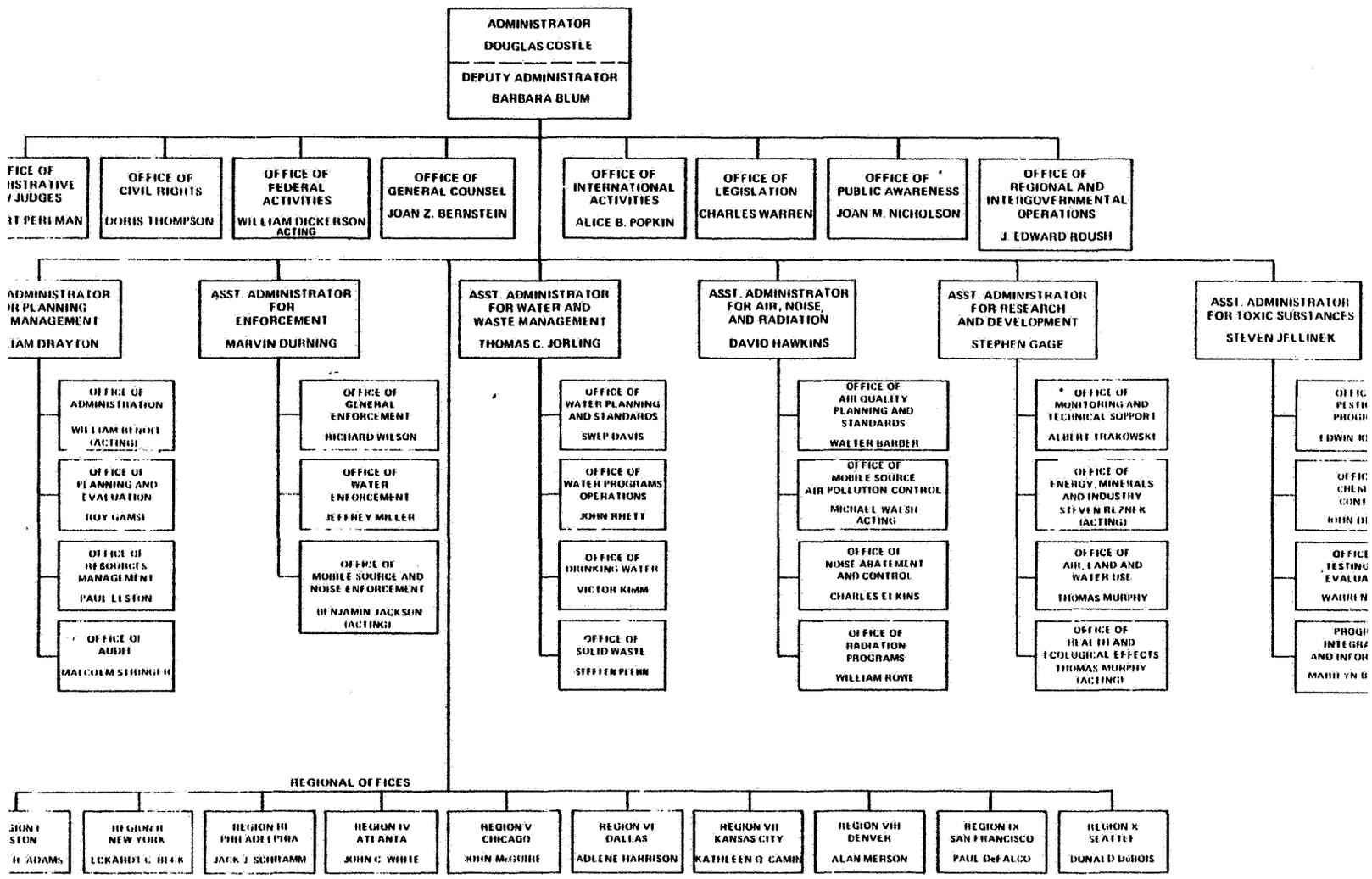
Project	1980 Costs (dollars in thousands)	Purpose
Coordinated Regulations Development Support.....	$200	Detailed economic and other analysis of the impact of a single regulation or group of closely related regulations on a single industry.
Micro/Macro Modelling.....	360	Assessments of the combined impacts of planned regulations on various segments of the national economy.
Analysis of Combined Impacts on Hard-Hit Industries.....	850	Studies of the combined impact of current or planned regulations on severely impacted industries.

Special Analyses

SPECIAL ANALYSES

Contents

U. S. ENVIRONMENTAL PROTECTION AGENCY



EPA Regions
Locations and States

Region I	Headquarters, Boston, Massachusetts	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
Region II	Headquarters, New York, New York	New Jersey, New York, Puerto Rico, Virgin Islands
Region III	Headquarters, Philadelphia, Pennsylvania	Delaware, Maryland, Pennsylvania, Virginia, West Virginia, District of Columbia
Region IV	Headquarters, Atlanta, Georgia	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee
Region V	Headquarters, Chicago, Illinois	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
Region VI	Headquarters, Dallas, Texas	Arkansas, New Mexico, Texas Oklahoma, Louisiana
Region VII	Headquarters, Kansas City, Missouri	Iowa, Kansas, Missouri, Nebraska
Region VIII	Headquarters, Denver, Colorado	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
Region IX	Headquarters, San Francisco, California	Arizona, California, Hawaii, Nevada, American Saoma, Guam, Trust Territories of Pacific Islands, Northern Mariana Islands
Region X	Headquarters, Seattle, Washington	Alaska, Idaho, Oregon, Washington

Summary of Resources
(dollars in thousands)

	Actual 1978	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs.1979
Research and Development				
Budget authority	$317,246	$334,034	$368,741	+$34,707
Obligations	329,716	331,975	368,641	+36,666
Outlays	281,914	329,800	353,800	+24,000
End-of-year employment	1,762	1,803	1,751	-52
Full-time equivalency	...	2,525	2,479	-46
Abatement and Control				
Budget authority	520,877	685,733	718,300	+32,567
Obligations	495,562	736,513	752,050	+15,537
Outlays	459,614	569,500	608,455	+38,955
End-of-year employment	4,633	4,928	5,122	+194
Full-time equivalency	...	5,897	6,083	+186
Enforcement				
Budget authority	73,730	96,812	95,676	-1,136
Obligations	72,965	96,851	95,676	-1,175
Outlays	64,842	92,700	91,000	-1,700
End-of-year employment	1,721	1,922	1,939	+17
Full-time equivalency	...	2,157	2,184	+27
Agency and Regional Management				
Budget authority	82,750	90,503	95,858	+5,355
Obligations	81,954	90,503	95,858	+5,355
Outlays	71,089	90,000	87,425	-2,575
End-of-year employment	1,936	1,981	2,059	+78
Full-time equivalency	...	2,625	2,693	+68
Buildings and Facilities				
Budget authority	...	1,063	1,425	+362
Obligations	2,424	2,140	1,425	-715
Outlays	1,274	1,800	2,000	+200

	Actual 1978	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Construction Grants				
Budget authority	$4,500,000	$4,200,000	$3,800,000	-$400,000
Obligations	2,859,908	3,400,000	3,600,000	+200,000
Outlays	3,186,825	3,100,000	3,600,000	+500,000
Scientific Activities Overseas				
Budget authority	4,000	2,500	4,000	+1,500
Obligations	2,220	5,377	4,000	-1,377
Outlays	1,422	2,500	3,600	+1,100
Operations, Research and Facilities				
Obligations	6,611	2,480	...	-2,480
Outlays	5,001	8,000	5,000	-3,000
End-of-year employment	...	...	...	...
Full-time equivalency	...	...	...	...
Revolving Fund				
Obligations	500	580	580	...
Outlays	64	...	...	...
End-of-year employment	...	...	...	...
Full-time equivalency	...	...	...	...
Trust Funds				
Budget authority	...	...	...	...
Obligations	26	18	30	+12
Outlays	19	...	80	+80
Reimbursements				
Obligations	13,044	17,390	15,510	-1,880
End-of-year employment	104	64	64	...
Full-time equivalency	...	71	62	-9
Regulatory Council				
Budget authority	...	...	3,238	+3,238
Obligations	...	...	3,238	+3,238
Outlays	...	...	2,600	+2,600
End-of-year employment	...	...	10	+10
Full-time equivalency	...	...	16	+16

	Actual 1978	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Consolidated Working Fund				
Obligations	...	...	...	...
Outlays	-83	47	...	-47
Total, Environmental Protection Agency				
Budget authority	5,498,602	5,410,645	5,087,238	-323,407
Obligations	3,864,930	4,683,827	4,937,008	+253,181
Outlays	4,071,981	4,194,347	4,753,960	+559,613
End-of-year employment	10,156	10,698	10,945	+247
Full-time equivalency	...	13,275	13,517	+242

1979 Resources
By Media and Appropriation
(dollars in thousands)

	Research and Development		Abatement and Control		Enforcement		Agency & Regional Management		Tot
	Pos.	Amount	Pos.	Amount	Pos.	Amount	Pos.	Amount	Pos.
Air	431	$53,207	892	$186,905	609	$30,505	...	...	1,932
Water Quality	531	66,616	1,796	237,755	800	27,640	...	...	3,127
Drinking Water	132	18,017	367	52,305	32	729	...	...	531
Solid Wastes	20	8,148	248	64,790	26	855	...	...	294
Pesticides	168	15,159	689	39,996	146	13,314	...	...	1,003
Radiation	26	1,970	179	8,360	...	...	...	...	205
Noise	...	...	75	10,008	22	1,005	...	...	97
Interdisciplinary	174	20,593	87	4,413	...	...	...	...	261
Toxic Substances	61	14,825	425	40,970	70	3,156	...	...	556
Energy	149	112,037	...	...	...	...	...	...	149
Management and Support	111	23,462	170	40,231	217	19,608	1,981	90,503	2,479
Subtotal	1,803	334,034	4,928	685,733	1,922	96,812	1,981	90,503	10,634
Buildings and Facilities	...	...	...	...	...	...	...	...	...
Scientific Activities Overseas	...	...	...	...	...	...	...	...	...
Reimbursements	...	...	...	...	...	...	...	...	64
Construction Grants	...	...	...	...	...	...	...	...	...
Total	1,803	334,034	4,928	685,733	1,922	96,812	1,981	90,503	10,634

1980 Resources
By Media and Appropriation

(dollars in thousands)

	Research and Development		Abatement and Control		Enforcement		Agency & Regional Management		Total	
	Pos.	Amount	Pos.	Amount	Pos.	Amount	Pos.	Amount	Pos.	A
Air.....	440	$71,963	943	$151,966	640	$31,881	...	...	2,023	$25
Water Quality.....	503	63,659	1,774	239,545	778	28,247	...	...	3,055	33
Drinking Water....	131	23,669	367	57,815	31	835	...	...	529	8
Solid Waste.....	20	8,143	261	59,972	46	2,174	...	...	327	7
Pesticides.....	133	9,638	735	40,456	116	12,156	...	...	984	6
Radiation.....	29	2,930	179	14,271	...	...	...	...	208	1
Noise.....	...	...	74	11,949	23	1,004	...	...	97	1
Interdisciplinary	168	24,549	76	28,553	...	...	...	...	244	5
Toxic Substances	92	33,977	553	65,543	78	3,796	...	...	723	10
Energy.....	140	102,461	...	...	...	...	...	...	140	10
Management and Support	95	27,752	160	48,230	227	15,583	2,059	$95,858	2,541	18
Subtotal.....	1,751	368,741	5,122	718,300	1,939	95,676	2,059	95,858	10,871	1,27
Regulatory Council.....	...	...	...	...	...	...	...	...	10	
Buildings and Facilities.	...	...	...	...	...	...	...	...	...	
Scientific Activities Overseas.....	...	...	...	...	...	...	...	...	...	
Reimbursements.....	...	...	...	...	...	...	...	...	64	
Subtotal.....	1,751	368,741	5,122	718,300	1,939	95,676	2,059	95,858	10,945	1,28
Construction Grants.....	...	...	...	...	...	...	...	...	...	3,80
Total.....	1,751	368,741	5,122	718,300	1,939	95,676	2,059	95,858	10,945	5,08

ENVIRONMENTAL PROTECTION AGENCY

Total Funds Obligated, 1979

(dollars in thousands)

	1979			
	Budget Authority	Unobligated Balance Brought Forward	Unobligated Balance Carried Forward	Tot Obliga
Research and Development	$334,034	+$7,912	-$9,972	$33
Air	53,207	+1,504	-4,000	5
Water Quality	66,616	+1,355	-2,896	6
Drinking Water	18,017	+175	...	1
Solid Wastes	8,148	+620	-201	
Pesticides	15,159	+22	...	1
Radiation	1,970	...	...	
Interdisciplinary	20,593	+3,196	-2,044	2
Toxic Substances	14,825	...	...	1
Energy	112,037	+1,040	-831	11
Program Management and Support	23,462	...	...	2
Abatement and Control	685,733	+113,680	-62,900	73
Air	186,905	+17,808	-26,178	17
Water Quality	237,755	+61,448	-21,066	27
Drinking Water	52,305	+8,337	-5,244	5
Solid Wastes	64,790	+1,039	-963	6
Pesticides	39,996	+4,872	-2,418	4
Radiation	8,360	+646	...	9
Noise	10,008	+384	-87	1
Interdisciplinary	4,413	+1,401	...	5
Toxic Substances	40,970	+7,236	-5,799	4
Program Management and Support	40,231	+10,509	-1,145	4

	1979			
	Budget Authority	Unobligated Balance Brought Forward	Unobligated Balance Carried Forward	Obligati
Enforcement	96,812	+39	...	96,
Air	30,505	...	...	30,
Water Quality	27,640	...	...	27,
Drinking Water	729	...	...	
Solid Wastes	855	...	...	
Pesticides	13,314	...	...	13,
Noise	1,005	...	...	1,
Toxic Substances	3,156	...	...	3,
Program Management and Support	19,608	+39	...	19,
Agency and Regional Management	90,503	...	...	90,
Agency Management and Support	69,572	...	...	69,
Regional Management and Support	20,931	...	...	20,
Buildings and Facilities	1,063	+1,077	...	2,
Scientific Activities Overseas	2,500	+2,877	...	5,
Construction Grants	4,200,000	+3,671,358	-4,571,358	3,300,
Operations, Research, and Facilities	...	+2,480	...	2,
Total	5,410,645	+3,799,423	-4,644,230	4,565,

Environmental Protection Agency

Total Funds Obligated, 1980

(in thousands of dollars)

	1980			
	Budget Authority	Unobligated Balance Brought Forward	Unobligated Balance Carried Forward	Total Obligations
Research and Development	$368,741	+9,972	-10,072	368,641
Air	71,962	+4,000	-2,940	73,022
Water Quality	63,659	+2,896	-3,164	63,391
Drinking Water	23,669	...	-412	23,257
Solid Waste	8,143	+201	-661	7,683
Pesticides	9,638	...	...	9,638
Radiation	2,930	...	...	2,930
Interdisciplinary	24,549	+2,044	-2,140	24,453
Toxic Substances	33,977	...	...	33,977
Energy	102,461	+831	-755	102,537
Program Management and Support	27,753	...	...	27,753
Abatement and Control	718,300	+62,900	-29,150	752,050
Air	151,966	+26,178	-2,238	175,906
Water Quality	239,545	+21,066	-16,288	244,323
Drinking Water	57,815	+5,244	-5,099	57,960
Solid Waste	59,972	+963	...	60,935
Pesticides	40,456	+2,418	-200	42,674
Radiation	14,271	...	-871	13,400
Noise	11,949	+87	-127	11,909
Interdisciplinary	28,553	...	...	28,553
Toxic Substances	65,543	+5,799	-3,164	68,178
Program Management and Support	48,230	+1,145	-1,163	48,212
Enforcement	95,676	...	...	95,676
Air	31,881	...	...	31,881
Water Quality	28,247	...	...	28,247
Drinking Water	834	...	...	834
Solid Waste	2,174	...	...	2,174
Pesticides	12,157	...	...	12,157
Noise	1,004	...	...	1,004
Toxic Substances	3,796	...	...	3,796
Program Management and Support	15,583	...	...	15,583

	1980			
	Budget Authority	Unobligated Balance Brought Forward	Unobligated Balance Carried Forward	Total Obligations
Agency and Regional Management	95,858	...	...	95,858
Agency Management and Support....	74,822	...	...	74,822
Regional Management and Support..	21,036	...	...	21,036
Buildings and Facilities	1,425	...	...	1,425
Scientific Activities Overseas	4,000	...	...	4,000
Regulatory Council	3,238	...	...	3,238
Construction Grants	3,800,000	+4,571,358	-4,871,358	3,500,000
Total.....	5,087,238	+4,644,230	-4,910,580	4,820,888

EPA
Positions By Grade and Average Employment

Grades	Actual 1978	Estimate 1979	Estimate 1980
Executive Level II	1	1	1
Executive Level III	1	1	1
Executive Level IV	6	6	6
Subtotal	8	8	8
GS-18	11	11	11
GS-17	43	43	43
GS-16	146	146	146
GS-15	455	455	468
GS-14	901	901	924
GS-13	1,368	1,380	1,418
GS-12	1,566	1,591	1,634
GS-11	1,082	1,129	1,156
GS-10	51	51	51
GS-9	858	911	936
GS-8	170	179	184
GS-7	783	825	841
GS-6	552	600	615
GS-5	867	927	949
GS-4	572	630	645
GS-3	176	235	240
GS-2	36	63	63
GS-1	5	39	39
Subtotal	9,642	10,116	10,363

Grades	Actual 1978	Estimate 1979	Estimate 1980
Positions established by act of July 1, 1974 (42 U.S.C. 207):			
Assistant Surgeon General, $25,022 to $36,468	1	1	1
Director Grade $19,547 to $32,040	91	91	91
Senior grade, $14,836 to $26,143	149	149	149
Full grade, $12,506 to $21,863	61	61	61
Senior assistant grade, $11,621 to $18,904	18	18	18
Assistant grade, $10,130 to $14,026	1	1	1
Junior assistant grade, $8,795 to $11,066	1	1	1
Subtotal	322	322	322
Positions established by act of November 16, 1977 (42 U.S.C. 201) compensation for which is not to exceed the maximum rate payable for a GS-18:	30	30	30
Upgraded	222	222	222
Total permanent positions	10,224	10,698	10,945
Full-Time Equivalency:			
Permanent	...	10,698	10,945
Other	...	2,577	2,572
Total	...	13,275	13,517

RESEARCH AND DEVELOPMENT

Classification by Objects
Includes Direct Obligations Only
(in thousands of dollars)

	Actual 1978	Current Estimate 1979	Estimate 1980
Personnel Services	$54,322	$61,220	$60,840
Other Objects:			
21 Travel and transportation of persons	3,114	2,967	3,141
22 Transportation of things	430	500	600
23.1 Standard level user charges	2,743	3,174	3,770
23.2 Communications, utilities, and other rent	5,996	6,500	6,600
24 Printing and reproduction	1,770	2,200	2,500
25 Other services	167,891	153,087	181,450
26 Supplies and materials	4,839	5,200	5,400
31 Equipment	9,310	10,000	10,000
32 Lands and structures	197	...	...
41 Grants, subsidies, and contributions	73,816	80,000	90,000
42 Insurance claims and indemnities	3	...	...
Total other objects	270,109	263,628	303,461
Total obligations	324,431	324,848	364,301
Position Data:			
Average salary, GS positions	$21,703	$21,564	$21,695
Average grade, GS positions	10.03	9.85	9.85

EXPLANATION OF INCREASES AND DECREASES TO OBJECT CLASSIFICATIONS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Personnel services	$54,322	$55,280	$61,220	$60,840	-$380

The increase in the 1979 current estimate over the 1979 budget estimate is the result of:

October 1978 pay raise	+2,900
Increase in average paid employment (FTE workyears)	+3,040
Total	+5,940

The decrease in the 1980 estimate is the result of:

Decrease in average paid employment (FTE workyears)	-893
Increase in number of paid days	+513
Total	-380

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Travel and Transportation of persons	$3,114	$3,025	$2,967	$3,141	+$174

The decrease of -$58 in the 1979 current estimate over the 1979 budget estimate is the result of a reduction in administrative travel costs.

The increase of +$174 in the 1980 estimate is the result of increased mileage and travel costs.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Transportation of things	$430	$500	$500	$600	+$100

There is no change from the 1979 budget estimate for this item.

The increase of +$100 in the 1980 estimate results from anticipated cost increases related to the handling and shipping of toxic substances for laboratory research.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Standard level user charges.....	$2,743	$3,769	$3,174	$3,770	+$596

The decrease of -$595 in the 1979 current estimate over the 1979 budget estimate results from a redistribution of the $19,838 i SLUC contained in the budget estimate among appropriations based on anticipated actual facilities usage by personnel.

The increase of +$596 in the 1980 estimate results from the GSA set increase of +$3,725 agencywide.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Communications, utilities, and other rent.....	$5,996	$6,000	$6,500	$6,600	+$100

The increase of +$500 in the 1979 current estimate over the 1979 budget estimate results from:

Decrease in agency prorated costs based on 1978 actual costs	-200
Increase in direct costs due to increased paid employment	+700
Total.....	+500

The increase of +$100 in the 1980 budget estimate results from increased prorated costs for nationwide telephone services and utilities costs related to the increase in average paid employment within this appropriation.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Printing and reproduction.....	$1,770	$2,200	$2,200	$2,500	+$300

There is no change from the 1979 budget estimate for this item.

The increase of +$300 in the 1980 estimate for this item results from an anticipated increase in the volume of printed reports and materials to be generated.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Other services.....	$167,891	$177,754	$153,087	$181,450	+$28,363

The decrease in the 1979 current estimate from the 1979 budget estimate for this item results from:

Congressional reduction for R&D contract activity	-6,000
Transfer to Grants subsidies and contributions, R&D	-11,500
Transfer to Personnel Comp & Benefits to support pay raise costs	-1,000
Transfer to other R&D activities to support increases	-6,167
Total.....	-24,667

The increase of +$28,363 in the 1980 budget estimate will primarily support expanded contracted research and development in the health affects area.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Supplies and materials.....	$4,839	$5,600	$5,200	$5,400	+$200

The decrease of -$400 in the 1979 current estimate over the 1979 budget estimate reflects adjustments based on actual 1978 costs.

The increase of +$200 in the 1980 estimate is based on increased costs for this item.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Equipment.....	$9,310	$8,900	$10,000	$10,000	...

The increase of +$1,100 in the 1979 current estimate over the 1979 budget estimate results from an increase in planned acquisitio of laboratory equipment.

There is no change in the 1980 budget estimate.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Lands and structures.....	$197	...	...	...	...

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Grants, subsidies, and contributions.....	$73,816	$58,100	$80,000	$90,000	+$10,000

The increase in the 1979 current estimate from the 1979 budget estimate for this item results from:

Congressional add-ons for R&D activities	+10,400
Transfer from other services	+11,500
Total.....	+21,900

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Insurance claims and indemnities.....	$3	...	...	...	...

ABATEMENT AND CONTROL

Classification by Objects
Includes Direct Obligations Only
(in thousands of dollars)

	Actual 1978	Current Estimate 1979	Estimate 1980
Personnel Services	$115,977	$139,020	$145,230
Other Objects:			
21 Travel and transportation of persons	6,912	7,678	8,186
22 Transportation of things	763	800	900
23.1 Standard level user charges	7,888	9,126	10,839
23.2 Communications, utilities, and other rent	11,039	12,000	13,000
24 Printing and reproduction	3,282	4,000	4,500
25 Other services	138,860	201,304	267,140
26 Supplies and materials	3,398	4,000	4,300
31 Equipment	6,080	6,500	7,000
32 Lands and structures	151	...	...
41 Grants, subsidies, and contributions	199,938	350,000	289,955
42 Insurance claims and indemnities	6	...	...
Total other objects	378,317	595,408	605,820
Total obligations	494,294	734,428	751,050
Position Data:			
Average salary, GS positions	$21,703	$21,564	$21,695
Average grade, GS positions	10.03	9.85	9.85

EXPLANATION OF INCREASES AND DECREASES TO OBJECT CLASSIFICATIONS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase Decrease 1980 vs. 1
Personnel services	$115,977	$115,094	$139,020	$145,230	+$6,210

The increase in the 1979 current estimate over the 1979 budget estimate is the result of:

October 1978 pay raise	+6,700
Increase in average paid employment (FTE workyears)	+16,495
Within grade increases	+731
Total	+23,926

The increase in the 1980 estimate is the result of:

Increase in number of paid days	+1,244
Increase in average paid employment (FTE workyears)	+4,966
Total	+6,210

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Travel and transportation of persons	$6,912	$7,788	$7,678	$8,186	+508

The decrease of -$110 in the 1979 current estimates over the 1979 budget estimates is the result of a reduction in adminis travel costs.

The increase in the 1980 estimate is the result of:

Additional positions requested	+237
Increased mileage and travel costs	+271
Total	+508

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Transportation of things	$763	$535	$800	$900	+$100

The increase in the 1979 current estimate from the 1979 budget estimate results from:

Adjustment to budget estimate to reflect actual 1978 costs	+228
Relocation of household goods of EPA personnel to states	+37
Total	+265

The increase of +$100 in the 1980 estimate results from anticipated household relocation costs for shortage scientific in toxic substances abatement and control areas.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
andard level user charges.....	$7,888	$8,927	$9,126	$10,839	+$1,713

The increase of +$199 in the 1979 current estimate over the 1979 budget estimate results from a redistribution of the $19,838 SLUC contained in the 1979 budget estimate among appropriations based on anticipated actual facilities usage by personnel.

The increase of +$1,713 in the 1980 estimate results from the GSA set increase of +$3,725 agencywide.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
mmunications, utilities, and other rent.....	$11,039	$13,509	$12,000	$13,000	+$1,000

The decrease of -$1,509 in the 1979 current estimate over the 1979 budget estimate for this item results from a decrease in orated costs based on 1978 actual costs.

The increase of +$1,000 in the 1980 budget estimate results from increased prorated costs for nationwide telephone services d utilities costs related to the increase in average paid employment within this appropriation.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
inting and reproduction.....	$3,282	$2,781	$4,000	$4,500	+$500

The increase in the 1979 current estimate over the 1979 budget estimate for this item results from:

Adjustments based on 1978 actual costs.....	+501
Unanticipated increase in regulation printing and publication	+718
Total.....	+1,219

The increase of +$500 in the 1980 estimate for this item results from an anticipated increase in the production of printed terials and other increases related to the increase in average paid employment within this appropriation.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Other services.....	$138,860	$219,487	$201,304	$267,140	+$65,836

The decrease in the 1979 current estimate over the 1979 budget estimate for this item results from:

Decrease in actual unobligated balances brought forward	-11,664
Transfer to A&C Personnel Comp & Benefits for increased pay costs	-4,000
Congressional reduction for Army Corps/IAG.....	-2,519
Total.....	-18,183

The increase in the 1980 estimate for this item results from:

Planned carryover for DOT/IAG.....	+25,000
Increase in requested budget authority for Army Corps/IAG (6,800), emission standards and technology assessment (14,843), effluent standards and guidelines (4,684), radiation environmental standards (4,421) and other program contracts within the toxic substances (A&C) program.....	+40,836
Total.....	+65,836

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Supplies and materials.....	$3,398	$3,629	$4,000	$4,300	+$300

The increase of +$371 in the 1979 current estimate over the 1979 budget estimate results from increased costs associated with the increase in average paid employment within the A&C appropriation.

The increase of +$300 in the 1980 estimate similarly results from increased costs associated with the increase in average p employment within the A&C appropriation.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Equipment.....	$6,080	$6,527	$6,500	$7,000	+$500

The decrease of -$27 in the 1979 current estimate over the 1979 budget estimate results from an adjustment based on actual costs.

The increase of +$500 in the 1980 budget estimate results from the planned acquisition and replacement primarily of regiona water quality monitoring laboratory equipment.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Lands and structures	$151	...	...	...	...

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Grants, subsidies, and contributions	$199,938	$287,350	$350,000	$289,955	-$60,045

The increase in the 1979 current estimate over the 1979 budget estimate results from:

Congressional add-ons increasing the budget authority for this item	+11,450
Increase in actual unobligated balances brought forward	+51,200
Total	+62,650

The decrease of -$60,045 in the 1980 estimate results from a decrease in unobligated balances to be brought forward from 1 as compared to 1978 to 1979.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Insurance claims and indemnities	$6	...	...	...	...

ENFORCEMENT

Classification by Objects
Includes Direct Obligations Only
(in thousands of dollars)

	Actual 1978	Current Estimate 1979	Estimate 1980
Personnel Services	$40,142	$49,275	$50,205
Other Objects:			
21 Travel and transportation of persons	2,631	3,200	3,837
22 Transportation of things	185	250	200
23.1 Standard level user charges	2,572	2,976	3,534
23.2 Communications, utilities, and other rent	4,424	5,000	5,000
24 Printing and reproduction	414	750	750
25 Other services	14,707	22,900	19,900
26 Supplies and materials	1,208	1,500	1,500
31 Equipment	1,361	2,000	2,000
32 Lands and structures	6	...	...
41 Grants, subsidies, and contributions	5,310	9,000	8,750
42 Insurance claims and indemnities	5	...	...
Total other objects	32,823	47,576	45,471
Total obligations	72,965	96,851	95,676
Position Data:			
Average salary, GS positions	$21,703	$21,564	$21,695
Average grade, GS positions	10.03	9.85	9.85

EXPLANATION OF INCREASES AND DECREASES TO OBJECT CLASSIFICATIONS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Personnel services	$40,142	$42,568	$49,275	$50,205	+$930

The increase in the 1979 current estimate over the 1979 budget estimate is the result of:

October 1978 pay raise	+2,500
Increase in average paid employment (FTE workyears)	+4,207
Total	+6,707

The increase in the 1980 estimate is the result of:

Increase in the number of paid days	+373
Increase in average paid employment	+557
Total	+930

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase Decrease 1980 vs. 1
Travel and transportation of persons	$2,631	$3,247	$3,200	$3,837	+$637

The decrease in the 1979 current estimate over the 1979 budget estimate is the result of a -$47 reduction in administrati staff travel costs.

The increase in the 1980 estimate is the result of:

Additional positions requested	+7
Increased mileage and travel costs	+192
Increased enforcement activities requiring travel	+438
Total	+637

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase Decrease 1980 vs. 1
Transportation of things	$185	$215	$250	$200	-$50

The increase of +$35 in the 1979 current estimate from the 1979 budget estimate results from unanticipated costs associat the relocation of households for market sample analysis labs to the NEIC and headquarters.

The reduction of -$50 in the 1980 estimate is due to the stabilization of the level of enforcement program personnel and resulting anticipated reduction in the need for household relocation.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
ındard level user charges.....	$2,572	$3,373	$2,976	$3,534	+$558

The decrease of -$397 in the 1979 current estimate from the 1979 budget estimate results from the redistribution of the $19,838 in JC contained in the 1979 budget estimate among appropriations based on anticipated actual facilities usage by personnel.

The increase of +$558 in the 1980 estimate results from the GSA set increase of +$3,725 agencywide.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
ımunications, utilities, and other rent.....	$4,424	$5,445	$5,000	$5,000	...

The decrease of -$445 in the 1979 current estimate over the 1979 budget estimate for this item results from a decrease in prorated ;ts based on 1978 actual costs.

There is no change in the 1980 estimate for this item due to the stabilization of the enforcement program at the 1979 personnel ɾel.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
nting and reproduction.....	$414	$523	$750	$750	...

The increase of +$227 in the 1979 current estimate over the 1979 budget estimate for this item results from the more than 250 workyear increase in average paid employment within this appropriation.

There is no change in the 1980 estimate for this item.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
ıer services.....	$14,707	$26,776	$22,900	$19,900	-$3,000

The decrease in the 1979 current estimate from the 1979 budget estimate results from:

Transfer to Enforcement Personnel Comp. & Benefits for pay raise costs	-700
Adjustment based on 1978 actual costs.....	-3,176
Total.....	-3,876

The decrease of -$3,000 in the 1980 budget estimate results from planned reductions in contractural services use within the orcement program.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Supplies and materials	$1,208	$1,517	$1,500	$1,500	...

The decrease of -$17 in the 1979 current estimate from the 1979 budget estimate results from an adjustment based on actual 1
costs.

There is no change in the 1980 estimate for this item.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Equipment	$1,361	$2,119	$2,000	$2,000	...

The decrease of -$119 in the 1979 current estimate from the 1979 budget estimate for this item results from an adjustment b
on actual 1978 costs.

There is no change in the 1980 estimate for this item.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Lands and structures	$6	...	...	...	...

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Grants, subsidies, and contributions	$5,310	$9,700	$9,000	$8,750	-$250

The decrease of -$700 in the 1979 current estimate from the 1979 budget estimate for this item reflects revised projections
the actual use of funds available for pesticides enforcement grants.

The decrease of -$250 in the 1980 estimate reflects the pesticides enforcement grant program contribution to the consolidate
grants program.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Insurance claims and indemnities	$5	...	...	...	...

AGENCY AND REGIONAL MANAGEMENT

Classification by Objects
Includes Direct Obligations Only
(in thousands of dollars)

	Actual 1978	Current Estimate 1979	Estimate 1980
Personnel Services	$52,113	$60,649	$62,860
Other Objects:			
21 Travel and transportation of persons	2,339	2,588	2,556
22 Transportation of things	158	200	300
23.1 Standard level user charges	3,944	4,562	5,420
23.2 Communications, utilities, and other rent	2,962	3,100	3,500
24 Printing and reproduction	577	700	800
25 Other services	17,150	15,854	17,372
26 Supplies and materials	805	1,000	1,200
31 Equipment	1,542	1,500	1,500
32 Lands and structures	43	...	...
41 Grants, subsidies, and contributions	321	350	350
Total other objects	29,841	29,854	32,998
Total obligations	81,954	90,503	95,858
Position Data:			
Average salary, GS positions	$21,703	$21,564	$21,695
Average grade, GS positions	10.03	9.85	9.85

EXPLANATION OF INCREASES AND DECREASES TO OBJECT CLASSIFICATIONS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Personnel services	$52,113	$52,686	$60,649	$62,860	+$2,211

The increase in the 1979 current estimate over the 1979 budget estimate is the result of:

October, 1978 pay raise	+3,000
Increase in average paid employment (FTE workyears)	+4,963
Total	+7,963

The increase in the 1980 estimate is the result of:

Increase in the number of paid days.....	+416
Increase in average paid employment.....	+1,795
Total.....	+2,211

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Travel and transportation of persons.....	$2,339	$2,641	$2,588	$2,556	-$32

The decrease in the 1979 current estimate over the 1979 budget estimate is the result of a -$53 reduction in administrative travel costs.

The decrease of -$32 in the 1980 estimate is the result of savings from planned reductions in executive development and tra activity.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Transportation of things.....	$158	$155	$200	$300	+$100

The increase of +$45 in the 1979 current estimate from the 1979 budget estimate and the increase of +$100 in the 1980 estima is the result of anticipated increased costs related to the transport of household goods for shortage personnel.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Standard level user charges.....	$3,944	$3,769	$4,562	$5,420	+$858

The increase of +$793 in the 1979 current estimate from the 1979 budget estimate results from the redistribution of the $19 in SLUC contained in the 1979 budget estimate among appropriations based on the anticipated actual facilities usage by personnel.

The increase of +$858 in the 1980 estimate results from the GSA set increase of +$3,725 for SLUC agencywide.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Communications, utilities, and other rent.....	$2,962	$4,624	$3,100	$3,500	+$400

The decrease of -$1,524 in the 1979 current estimate over the 1979 budget estimate for this item results from a decrease in prorated costs based on 1978 actual costs.

The increase of +$400 for this item in the 1980 estimate results from increased prorated costs for nationwide telephone ser and utilities related to the increase in average paid employment within this appropriation.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Printing and reproduction	$577	$691	$700	$800	+$100

The increase of +$9 in the 1979 current estimate over the 1979 budget estimate for this item results from adjustments based 1978 actual costs.

The increase of +$100 in the 1980 estimate results from increased average paid employment within this appropriation and a planned increase in analytic activity and reports.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Other services	$17,150	$17,991	$15,854	$17,372	+$1,518

The decrease in the 1979 current estimate from the 1979 budget estimate results from:

ADP contractural services cost savings	-1,000
Transfer to ARM Personnel Comp. & Benefits for pay raise costs	-1,000
Reduction in contract support for executive development and training program	-137
Total	-2,137

The increase of +$1,518 in the 1980 estimate results from requested increases in contractual support for science advisory b activities transferred from R&D and professional training.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Supplies and materials	$805	$1,026	$1,000	$1,200	+$200

The decrease of -$26 in the 1979 current estimate from the 1979 budget estimate is an adjustment based on actual 1978 costs

The increase of +$200 in the 1980 estimate results from increased costs associated with the increase in average paid employ within the agency and regional management appropriation.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
ıipment	$1,542	$602	$1,500	$1,500	...

The increase of +$898 in the 1979 current estimate over the 1979 budget estimate for this item is an adjustment based on actual '8 costs.

There is no change in the 1980 estimate for this item.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
ıds and structures	$43	...	...	...	...

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
ınts, subsidies, and contributions	$321	...	$350	$350	...

The increase of +$350 in the 1979 current estimate over the 1979 budget estimate for this item is due to the omission of funds - grants to public interest groups from the 1979 budget estimate.

There is no change in the 1980 estimate for this item.

BUILDINGS AND FACILITIES

Classification by Objects
Includes Direct Obligations Only
(in thousands of dollars)

		Actual 1978	Current Estimate 1979	Estimate 1980
)ther Objects:				
21	Travel and transportation of persons	$21	$30	$35
24	Printing and reproduction	...	5	5
25	Other Services	1,330	995	660
26	Supplies and materials	6	10	10
31	Equipment	49	100	100
32	Lands and structures	1,018	1,000	615
	Total obligations	2,424	2,140	1,425

EXPLANATION OF INCREASES AND DECREASES TO OBJECT CLASSIFICATIONS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Travel and transportation of persons	$21	$30	$30	$35	+$5

There is no change from the 1979 budget estimate for this item.

The increase of +$5 in the 1980 estimate is the result of a planned increase in the number of repair and improvement projects to EPA facilities in 1980.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Printing and reproduction	...	$3	$5	$5	...

The increase of +$2 in the 1979 current estimate over the 1979 budget estimate for this item results from an adjustment to anticipated actual costs.

There is no change in the 1980 estimate for this item.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Other services	$1,330	$2,180	$995	$660	-$335

The decrease in the 1979 current estimate from the 1979 budget estimate for this item results from:

An unanticipated increase in unobligated balances carried forward	+1,077
A Congressional reduction applied to this item	-1,500
Transfers to support other Buildings and Facilities items	-762
Total	-1,185

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Supplies and materials	$6	$10	$10	$10	...

There is no change from the 1979 budget estimate for this item.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Equipment	$49	$40	$100	$100	...

The increase of +$60 in the 1979 current estimate over the 1979 budget estimate results from an adjustment in anticipated actual costs.

There is no change in the 1980 estimate for this item.

	Actual 1979	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Lands and structures	$1,018	$300	$1,000	$615	-$385

The increase of +$700 in the 1979 current estimate over the 1979 budget estimate for this item is based on estimates of actual need for 1979.

The 1980 estimate for this item is decreased by -$385.

SCIENTIFIC ACTIVITIES OVERSEAS

Classification by Objects
Includes Direct Obligations Only
(in thousands of dollars)

	Actual 1978	Current Estimate 1979	Estimate 1980
ersonnel services	...	...	...
ther objects:			
1 Travel and transportation of persons	27	20	25
5 Other services	2,193	5,357	3,975
Total, other objects	2,220	5,377	4,000
Total, Obligations	2,220	5,377	4,000

XPLANATION OF INCREASES AND DECREASES TO OBJECT CLASSIFICATIONS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
ravel and Transportation of persons	$27	$20	$20	$25	+$5

There is no change from the 1979 budget estimate for this item.

The increase of +$5 in the 1980 estimate is the result of increased overseas travel costs.

ther Services	$2,193	$3,980	$5,357	$3,975	-$1,382

The increase of +$1,377 in the 1979 current estimate over the 1979 budget estimate for this item esults from a $2,877 increase in unobligated balances brought forward from 1978 offset by a congressional eduction of $1,500.

The decrease of -$1,382 in the 1980 estimate results from the anticipated reduction in unobligated alances to be brought forward.

REGULATORY COUNCIL

Classification by Objects
Includes Direct Obligations Only
(in thousands of dollars)

	Actual 1978	Current Estimate 1979	Estimate 1980
Personnel Services	...	...	$423
Other Objects:			
21 Travel and transportation of persons	...	...	20
23 Rent, communications, and utilities	...	...	35
24 Printing and reproduction	...	...	17
25 Other services	...	...	2,728
26 Supplies and materials	...	...	12
31 Equipment	...	...	3
Total other objects	...	...	2,815
Total obligations	...	...	3,238

EXPLANATION OF INCREASES AND DECREASES TO OBJECT CLASSIFICATIONS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Personnel services	...	...	...	$423	+$423

The increase of +423 for this item results from the proposed establishment of the Regulatory Council with the EPA Administ as Chairman.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Travel and transportation of persons	...	...	...	$20	+$20

The increase of +$20 in the 1980 estimate for this item results from the proposed establishment of the Regulatory Council EPA's Administrator as Chairman.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Rent, communications, and utilities, and other rent.....	...	...	...	$35	+$35

The increase of +$35 in the 1980 estimate for this item results from the proposed establishment of the Regulatory Council w EPA's Administrator as Chairman.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 19
Printing and reproduction.....	...	...	...	$17	+$17

The increase of +$17 in the 1980 estimate for this item results from the proposed establishment of the Regulatory Council w EPA's Administrator as Chairman.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Other services.....	...	...	...	$2,728	+$2,728

The increase of +$2,728 in the 1980 estimate for this item results from the proposed establishment of the Regulatory Counci with EPA's Administrator as Chairman.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Supplies and materials.....	...	...	...	$12	+$12

The increase of +$12 in the 1980 estimate for this item results from the proposed establishment of the Regulatory Council with EPA's Administrator as Chairman.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 197
Equipment.....	...	...	...	$12	+$12

The increase of +$12 in the 1980 estimate for this item results from the proposed establishment of the Regulatory Council w EPA's Administrator as Chairman.

Noise

Abatement and Control

Abatement and Control

Environmental Noise Strategies and Standards

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Noise Standards Development..	$5,564	$3,583	$3,660	$3,564	-$96
Noise Control Technology Assessment and Criteria Developmemt.....	3,127	2,098	2,047	2,598	+551
Total.....	8,691	5,681	5,707	6,162	+455
Permanent Position					
Noise Standards Development..	22	21	21	21	...
Noise Control Technology Assessment and Criteria Development.....	15	14	14	14	...
Total.....	37	35	35	35	...
Full-Time Equivalency					
Noise Standards Development..	...	...	26	28	+2
Noise Control Technology Assessment and Criteria Development.....	...	...	22	24	+2
Total.....	...	...	48	52	+4

Budget Request

The resources requested are $6,162,000, and 35 positions. This reflects an increase of $455,000 over the 1979 level for initiation of a health effects investigation program. This program is mandated by the Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978, and will provide improved criteria for regulations development as well as overall support for State and local noise control programs.

Program Description

This program focuses on the development and promulgation of emission and labeling regulations that will reduce harmful noise emissions from new products. These regulations are developed through the gathering and analysis of data on noise and its health effects to determine exposure criteria and levels of noise reduction required for abatement options and for specific regulatory actions. Evaluations of private and public sector technology development are performed to determine best available technology, and assessments of economic, environmental and health data are made to ascertain the costs and benefits of regulation. This program also includes continuation of a noise health and welfare effects investigation program.

Noise Standards Development

The objective of noise product regulation is to effectively regulate products which are major contributors to environmental noise exposure. Such regulation is necessary to the achievement of overall environmental noise control goals of reducing environmental levels below Ldn 75 dB as soon as possible and ultimately below Ldn 65 dB.

Section 6 and 8 of the Noise Control Act require the Environmental Protection Agency to develop and promulgate regulations for control of noise from products which are major noise sources through the use of new product noise emission limitations and/or new product noise labeling requirements. The analysis leading to and supporting these regulations includes the preliminary investigation of potential products for regulation, economic and technological feasibility and the evaluation of health, welfare, and other benefits derived from specific product regulation. Other activities include the preparation of necessary background and supporting material, such as EIS and economic assessments, and the preparation of rule making material for the promulgation of standards.

Noise Control Technology Assessment and Criteria Development

The objective of this activity is to provide support to EPA for noise product regulation and State and local control efforts through investigations and documentation of noise health effects and availability of noise control technology. This also includes overall strategy developement for national noise control efforts.

Specific activities include the development of health and welfare criteria for the assessment of general exposure to noise; the assessment of the environmental, economic, social and health impacts of noise abatement options; and the assessment of advanced and/or future noise control technology for the development and evaluation of noise abatement options, including coordination and evaluation of noise research and development conducted by other Federal agencies. Other activities encompass the development of an overall noise control stategy and subsequent substrategies, and the expansion of the noise health effects program.

NOISE STANDARDS DEVELOPMENT

1978 Accomplishment

1978 resources included approximately $3.1 million in contract support. These funds were used for development of noise emission and label regulations and for initial studies of products which may require regulation or labeling. Major accomplishments for 1978 included proposal of a noise regulation for motorcycles and the holding of public hearings on proposed regulations for buses and motorcycles. In addition, work was carried out which will lead to future promulgation of emission regulations for railroad facilities, buses, wheel and crawler tractors, lawnmowers, and pavement breakers and rock drills and revision of interstate motor carrier regulations. Development of general labeling regulations and labeling of hearing protectors, was continued and preregulation studies were initiated on medium and heavy trucks, light-duty vehicles, and other noise sources.

1979 Program

This program element has been allocated $3.6 million and 21 positions. These resources include an estimated $2.6 million in contract funds.

The 1979 program provides for the promulgation of emission regulations for buses and solid waste compactors. It also provides for the proposal of emission regulations controlling pavement breakers and rock drills. Other regulatory activities include both the proposal and promulgation of a court ordered revision of the railroad regulation; the promulgation of general provisions for labeling and specific requirements for hearing protectors; initiation of work on revision of the medium and heavy-duty truck regulation and interstate motor carrier regulation; and developmental work for possible regulation of tires and light-duty vehicles.

1979 Explanation of Changes from Budget Request

The net increase of +$76,900 results from two actions. An increase of +$57,200 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$19,700 was reprogrammed to this element from noise control technology assessment and criteria development.

1980 Plan

The 1980 plan includes $3.6 million and 21 positions. During 1980, regulatory activities will include promulgation of emission regulations for motorcycles and pavement breakers and rock drills, and the proposal of revisions to interstate motor carrier regulations, emission regulation for lawnmowers, and proposal of labeling regulations for a major consumer product. Work will continue on medium and heavy-duty trucks, tires, interstate motor carrier revision and light-duty vehicles. In addition, work will continue on the labeling program, with the selection of additional products -- possibly chainsaws. Work will be reinitiated on emission regulations for earthmoving equipment.

NOISE CONTROL TECHNOLOGY ASSESSMENT AND CRITERIA DEVELOPMENT

1978 Accomplishments

Fiscal year 1978 resources included approximately $1.7 million in contract support. These funds were used for technology research studies on quiet trucks and internal combustion engines. These technology studies were intended to provide support to on-going and future regulatory activities. Although these technology demonstration efforts are still underway, some results have already been obtained. With regard to the truck program (four vehicles being tested), and initial review of some of the results indicate that it may be possible to attain lower noise levels than presently required by the current EPA regulations on medium and heavy duty trucks. With regard to the internal combustion engine study, a survey of engine types and designs with accompanying noise levels has been completed. This survey is identifying the correlation between cylinder pressure ratio, ignition temperature, engine speed, and engine design with noise levels.

Also, during 1978, health and welfare assessments were carried out for regulatory actions under development and work was initiated on the development of a simplified version of the "levels document" to be used by State and local governments and any others who lack specific noise expertise.

1979 Program

The work on activities related to the development of health and welfare criteria, the assessment of noise control technology, and noise control strategy is allocated $2.0 million and four positions. These resources include an estimated $1.5 million in contract funds for health effects advanced/or future noise control technology investigations, and noise substrategies developments. During 1979, work will continue on the quiet truck and internal combustion engine technology demonstration studies.

The noise health effects program will continue. This program is designed to generate improved criteria for the development of regulations and to provide overall support for State and local programs. A health and welfare study on the cardiovascular effects of noise begun in 1978 will continue as will work on health and welfare assessments of current regulatory actions.

In addition, studies will be carried out to support the preparation of program substrategies for construction site noise and household and customer product noise. These substrategies are an expansion of the national noise strategy document and provide more detailed program direction for addressing specific noise problem areas.

1979 Expanation of Changes from Budget Request

The net decrease of -$51,000 results from two actions. A net increase of $18,100 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$69,100 was reprogrammed from this element to noise standards development ($19,700), noise strategies implementation ($900) and regional noise program implementation ($48,500).

1980 Plan

The 1980 plan includes $2.5 million and 14 positions. During 1980, three previously initiated technology investigations on engines, trucks, and tires will be continued. Also the noise health effects research program will generate dose/response criteria primarily in the area of nonauditory effects. This program would represent the first attempt at systematically identifying and characterizing the broad spectrum of detrimental health effects generated by noise. The results of this effort will serve as basis guidance in the establishment of future program priorities for all Federal, State, and local noise abatement activities. These criteria will serve as both the basis of EPA's regulatory and standards setting actions, as well as a basis for the establishment of overall program priorities in all program areas.

Abatement and Control

Noise Program Strategies Implementation

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs 1979
			(dollars in thousands)		
Appropriation					
Noise Control Implementation and Evaluation.....	$1,706	$2,892	$2,913	$4,392	+$1,479
Federal Agency Coordination.....	704	672	684	672	-12
Noise Regional Program Implementation.....	661	522	704	723	+19
Total.....	3,071	4,086	4,301	5,787	+1,486
Permanent Positions					
Noise Control Implementation and Evaluation.....	13	16	16	16	...
Federal Agency Coordination.....	7	9	9	9	...
Noise Regional Program Implementation.....	15	15	15	14	-1
Total.....	35	40	40	39	-1
Full-Time Equivalency					
Noise Control Implementation and Evaluation.....	...	...	43	52	+9
Federal Agency Coordination	...	...	12	12	...
Noise Regional Program Implementation.....	...	...	22	23	+1
Total.....	...	...	77	87	+10

Budget Request

The resources requested for this budget subactivity are $5,787,000 and 39 positions. This reflects an increase of $1,486,000 over the 1979 level for expanded assistance to States and localities. This program, a requirement of the Noise Control Act of 1978, will encourage State and local governments to develop or improve their noise control programs.

Program Description

This program provides assistance to State and local noise control programs, including but not limited to consultation with States and localities on specific noise abatement problems. Effective State and local noise control programs are essential if the Nation is to reduce noise to levels commensurate with the protection of public health and welfare. In recognition of this need, the Noise Control Act, as amended by the Quiet Communities Act, and the EPA

noise program strategy document call for EPA to conduct technical assistance programs to service both State and local governments. The objective of the assistance program is to substantially increase the number of communities having effective noise control programs with special emphasis on the following noise program components: motor vehicle control (motorcycles, trucks, autos), stationary source control (fence line standards), construction noise control, noise abatement planning (zoning, land use planning, airport planning), and public information.

This program also includes the implementation of regulatory requirements for which the Federal Government has primary responsibility (i.e., the control of noise emissions at Federal facilities and review of EIS's for their noise impact), and the overall coordination of all Federal programs for noise abatement and control. The objective of this program is to bring the major noise authorities of other Federal agencies to bear on the noise problem in a total national effort. Included are such agencies as the Federal Highway Administration, the Federal Aviation Administration, the Urban Mass Transit Administration, the Department of Housing and Urban Development, and the Department of Defense.

Noise Control Implementation and Evaluation

The Noise Control Act, as amended by the Quiet Communities Act of 1978, directs the Environmental Protection Agency to deliver assistance to States and localities in order to encourage the development of effective noise control, including encouragement of State and local actions to complement EPA's noise emission regulations. One of the objectives of this program is to have in place, by 1985, 400 effective local noise control programs and 40 effective State programs. The local programs may cover one or all of the noise program components identified above depending on local need. The goal of 400 operational noise program is targeted to cities with populations over 50,000 since noise problems tend to be greater in more highly populated areas. However, smaller cities that are a part of larger urban aggregations are also included in some instances since they share "urban" characteristics. In addition, some smaller communities may have particular problems which will require regulatory actions and EPA assistance. EPA has an additional goal of adding 400 program components to existing noise control programs. Effective State and local programs are needed to complement EPA regulations for major sources of noise. This will include State and local enforcement of in-use controls which supplement EPA's manufacturing controls, and assistance in enforcement of Federal antitampering provisions.

Further efforts are needed to assist State and local control programs, the programs of other Federal agencies and EPA noise control regulations in a combined effort to reduce noise exposure in highly impacted urban areas. This will require effective local noise control and planning, the cooperation of all concerned Federal agencies and special EPA efforts.

This program also provides funding for limited financial assistance to States and localities and the design and administration of assistance programs for State and local use. Such assistance includes the Each Community Helps Others (ECHO) program, development of State and local program "tools", e.g. model laws and codes, and administration of the noise control demonstration and assistance program.

Federal Agency Coordination

The activities of this program are directed toward assuring that Federal Government responsibilities for noise control are met. Such activities include assisting other Federal agencies to consider and include where appropriate, noise abatement and control practices in their programs and comply with Federal, State, interstate, and local requirements; coordinating noise control programs carried out by Federal agencies; monitoring the progress of other Federal facilities' noise abatement activities; and reviewing Federal environmental impact statements insofar as their noise impacts are concerned.

In the aviation areas, the EPA will continue to review Federal Aviation Agency actions concerning aviation noise. This includes tracking FAA follow-up to regulations previously recommended by EPA. There will be some work on possible reproposal of the EPA recommended regulations in the future concerning small propeller driven aircraft and turbo jet aircraft. These were previously rejected by the FAA, and the EPA will review and update them prior to reproposal.

Noise Regional Implementation

The regional offices occupy a key role in the development of effective State and local programs.

Specifically, regional offices provide the focal point for interaction with State and local governments, and the development of State and local government capabilities to implement noise abatement activities. As such, they provide general technical support, as well as regional coordination and support of national public awareness programs, demonstration projects and regulations development.

NOISE CONTROL IMPLEMENTATION AND EVALUATION

1978 Accomplishments

1978 resources included approximately $1.3 million in contract support. These funds were used for development and delivery of assistance to States and localities and for demonstration projects with other Federal agencies.

During 1978, the EPA greatly enhanced its capability to develop and deliver technical assistance to States and localities in developing noise control programs. A major accomplishment was the initiation of Quiet Communities Program (QCP) experiment through a demonstration effort in Allentown, Pennsylvania. This program is designed to develop and demonstrate the best available techniques for noise control in various types of communities. Another effort, the Each Community Helps Others program, was also begun. Under this program, local noise control experts volunteer to assist other communities one or two days a month with EPA paying out of pocket expenses. At the end of 1978, 10 of these volunteers had been recruited and were providing technical assistance. EPA also initiated a "State Assignees" program. These assignees are temporary Federal employees serving in State governments to assist in the development of noise control programs. During 1978, EPA allocated 10 assignees to States (one each to New York, Connecticut, Maryland, Florida, Michigan, Iowa, New Mexico, North Dakota, California, and Washington). Other activities included the development and implementation of general public information and education programs concerning noise abatement and control. Other efforts included the support of airport noise abatement planning programs in five communities; these projects are designed to produce an airport plan which will produce the most minimum noise impact on people through modification of take-off and approach procedures, runways, scheduling and other controls.

1979 Program

The work on State and local program development has been allocated $2.9 million and 16 positions. These resources include an estimated $2.3 million in contract funds.

In 1979, the EPA-run ECHO program is being maintained with nine States expected to initiate ECHO programs of their own. The number of Community Noise Advisors is being increased from 10 to 25. Two cities are being added to the QCP program experiment. The major change in EPA noise technical assistance to State and local communities during 1979 is greater emphasis in the targeting of local noise programs to focus on the local noise program components of greatest need (e.g., motor vehicle control, stationary source control, construction noise control, planning, and public information). These programs are mandated by the Noise Control Act, as amended by the Quiet Communities Act of 1978. The State Assignee program will continue at the 1978 level.

1979 Explanation of Changes From Budget Request

The net increase of +$21,700 results from two actions. A net increase of $20,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, $900 was reprogrammed to this element from noise control technology assessment and criteria development.

1980 Plan

The 1980 plan includes $4.4 million and 16 positions. During 1980, the noise programs will provide increased assistance to State and local governments. This will include equipment loan, training, survey work, and development of community ordinances and limited financial assistance.

In addition, the EPA will enter into agreements with some States. These agreements will enable the State to carry out a statewide ECHO (Each Community Helps Others) program, taking over from the EPA the ECHO function, which involves recruiting Community Noise Advisors (individuals already in active local noise control programs) to provide assistance to other communities in the same State requesting assistance. Although the advisors are volunteers, the State will pay their travel costs with EPA funds. In addition, EPA will be encouraging States to buy equipment and make it available to communities on a loan basis.

The main focus for EPA's 1980 transportation planning effort will be on highways. A project to demonstrate or evaluate one of several highway noise abatement techniques will be in cooperation with the Department of Transportation. Such techniques include building barriers, new roadsurfacing material, truck rerouting on an existing road, zoning the undeveloped land around an existing road, and planning a new road.

Projects to enable EPA to evaluate various techniques for controlling noise will be initiated. These will include testing model legislation and ordinances, evaluating enforcement techniques, methods of assessing noise impacts, and the specific impact of certain noise sources.

This program will continue to support development and testing of comprehensive (all components) noise control programs. These projects will be increasingly tied in with EPA noise control emission regulations, other Agency programs (such as the Department of Energy's program for energy conservation), and the EPA's motor vehicle emissions control and fuel economy programs.

The State Assignee program will be continued at its 1979 level. However, the States in the program may change.

A continuing level of national public information support will be carried out in 1980 covering such areas as: development of educational curricula for schools and people who receive high noise exposure; information on health and other effects of noise; publicizing EPA's State and local assistance activities and State and local efforts to control noise; and information support to the EPA noise labeling program.

EPA will carry out a new study with the Department of Transportation of aviation noise at one U.S. airport (Philadelphia) as required by Section 8 of the Quiet Communities Act of 1978. The purpose of the study is to determine the aircraft noise effects from an airport on communities located in a state other than the State in which the airport is located.

Efforts will continue to deliver program tools to States and localities through assistance. Among the most important of these tools is the Local Information System to Evaluate Noise (LISTEN). This is a computer program which localities can use to evaluate attitudinal and physical noise data and to incorporate them into a noise control strategy tailored to meet the locality's needs. EPA will provide this computer analysis service to localities.

FEDERAL AGENCY COORDINATION

1978 Accomplishments

1978 resources included $400,000 in contract support. All of these funds were used to support interagency agreements with other Federal agencies. This approach accomplishes three things: a noise control demonstration is carried out and techniques are tested; the EPA funds are enhanced by contributions from other Agencies; and the results of the demonstrations can be incorporated into the appropriate program of the Federal agency. For example, the study of shipyard noise being carried out with the Department of Navy will result in techniques which can be applied at all Navy shipyards as well as the private sector metal fabrication facilities. The 1978 funds were also used for the continuation of three interagency agreements and the initiation of six new ones. These included work on vehicle inspection (Department of Transportation), off-road vehicles (Department of Interior), highway noise mitigation (Department of Transportation), bus transit malls (Department of Transportation), general construction sites (Army Corps of Engineers), shipyard occupation exposure (Department of Navy), power plant occupation (Tennessee Valley Authority), and community noise exposure and improved building construction design (Department of Energy).

1979 Program

Federal programs coordination has been allocated $684,000 and nine positions.

These resources will continue and complete funding for interagency agreements begun in earlier years to carry out noise abatement demonstrations on bus transit mall retrofit, power plant occupational and environmental exposure, and building construction techniques to produce quiet and energy efficient dwellings, the Federal hearing conservation program with OSHA, the construction site environmental noise exposure demonstration, Federal procurement experiment to acquire quiet products, joint DOD/civilian airport study, off-road vehicle noise reduction, highway noise mitigation, and noise compatible land use planning.

A final report will be issued on each interagency demonstration in 1980 or 1981. These reports will describe the control techniques area and results obtained. The EPA and the agencies involved will work together to insure that successful techniques will be applied elsewhere in the Federal and private sectors as a result of this documentation.

1979 Explanation of Changes from Budget Request

The net increase of +$11,700 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise.

1980 Plan

The 1980 plan includes $672,000 and nine positions. During 1980, EPA will initiate interagency agreements to carry out noise control demonstrations on rapidrail noise, industrial noise exposure, and building techniques to control dwelling noise and energy consumptions. EPA will try to integrate these demonstration effects into its interagency urban noise control program which was begun in 1979. The EPA has set up an interagency urban noise task force to insure that noise control is an integral part of the "urban initiative". The vehicle diagnostic inspection interagency agreement with the National Highway Traffic Safety Administration will be continued. The agency will also continue to be active in developing an overall strategy for urban noise control. The EPA will continue to review FAA activities concerning aviation noise abatement.

NOISE REGIONAL PROGRAM IMPLEMENTATION

1978 Accomplishments

Major activities for 1978 included regional staff participation in the initiation of three major programs: Each Community Helps Others (ECHO), Quiet Communities Program experiment (QCP) and State Assignees. Although funding and primary administration is carried by the headquarters staff, the regions act as project managers for these projects in their specific regions. This includes on-site assistance in QCP demonstration and arranging for ECHO "Community Noise Advisors" to provide assistance to communities in the region. Other activities carried out included: the review of environmental impact statements, the holding of noise abatement workshops for State and local officials, the providing of direct technical assistance to local communities and public education on noise abatement and control. Regional review of Federal facilities, to assure compliance with noise regulations, and regional support to headquarters for the development of railroad regulations were also provided for.

1979 Program

The regional noise control effort has been allocated $704,000 and 15 positions.

This includes approximately $175,000 for contracts and equipment.

1979 will see a continuation of all 1978 activities with nine States taking over the EPA ECHO program in their States. The regions will take the lead role in managing the national EPA ECHO program and will be involved in assisting the States in taking over this program. Quiet Community Program experiments will be carried out in three regions (one from the previous year and two new ones). 1979 regional activities will also include a project management role in administering the State and local noise control start-up assistance program. The regions will continue to operate the loan equipment program on an expanded basis in 1979. The regions will also continue to deliver technical assistance in the form of on-site visits and workshops.

1979 Explanation of Changes from Budget Request

The net increase of +$181,600 results from several actions. A net increase of +$96,500 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$85,100 was reprogrammed to this element from noise control technology assessment and criteria development ($48,500) and from ambient air quality monitoring ($36,600).

1980 Plan

The 1980 plan includes $723,000 and 14 positions. This includes approximately $175,000 for contracts and equipment.

During 1980, the regions will continue to administer the assistance program to State and local governments. They will assist headquarters in the operation of noise control demonstrations. They will also continue to manage QCP experiments in two communities and continue to manage the ECHO Program and will assist some States in taking over the EPA ECHO program in their States. The equipment loan program will be continued as will noise control workshops and on-site visits.

Enforcement

Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Noise Enforcement.....	$1,048	$916	$1,005	$1,004	-$1
Permanent Positions					
Noise Enforcement.....	22	22	22	23	+1
Full-Time Equivalency					
Noise Enforcement.....	...	...	38	39	+1

Budget Request

The request for $1,004,000 and 23 positions will provide: (1) for the enforcement of the new product noise emission standards for portable air compressors and medium and heavy duty trucks; (2) for the development of enforcement assistance and guidance to State and local noise enforcement programs; and (3) for the development of enforcement strategies and the attendant regulatory packages for additional noise emission standards and informational labeling requirements.

Program Description

The noise enforcement program provides for the enforcement of new product noise emission standards and labeling regulations pursuant to Sections 6 and 8, respectively, of the Noise Control Act of 1972. It also provides for development of enforcement strategies and regulations for additional new product noise emission standards and for labeling requirements as necessary, anti-tampering inspections, surveillance activities, recalls, and continued participation in providing assistance to State and local jurisdictions for the development of in-use noise enforcement programs.

1978 Accomplishments

In 1978, the noise emission standards for portable air compressors and medium and heavy duty trucks became effective. The primary emphasis of the noise enforcement program was the enforcement of these standards. Records of all major truck and compressor manufacturers were inspected. Enforcement activities that were conducted in 1978 included the review of 935 production verification reports, the monitoring of four production verification tests and six selective enforcement audits, and the conducting of six test site comparison studies. Also, enforcement assistance and guidance was provided to approximately 30 State and local noise enforcement programs. A general noise enforcement training course for police officers was developed and adapted for and presented to police in Allentown, Pennsylvania, the first Quiet Community.

Additionally, the enforcement regulations for the proposed noise emission standard for new motorcycles and for after-market motorcycle exhaust systems were proposed on March 15, 1978. A regulation for conducting administrative hearings under the Noise Control Act was proposed on August 3, 1978. Regulations for the enforcement of the noise emission standards for buses, and trash compactors were being finalized for promulgation in 1979. Enforcement sections of the general labeling provisions and of the labeling requirement for hearing protectors was also being finalized for promulgation in 1979.

The 1978 resources included $325,000 for contracts that were used to conduct surveillance testing of in-use, regulated portable air compressors; to provide technical expertise on the manufacture, distribution, and operation of both compressors and trucks; to develop and present noise enforcement training packages for State and local police officers and for police academy training directors and junior college instructors; to compile a catalog of experts in State and local noise enforcement; and to develop a noise enforcement guidance manual for State and local prosecutors.

1979 Program

Activities relating to the enforcement of new product noise emission standards for portable air compressors and medium and heavy duty trucks will continue in 1979. Production verification reports will be reviewed; production verification tests will be monitored (15) and conducted (5). Selective enforcement audits will also be monitored (12). Inspections of manufacturers' records and facilities (18) will be conducted as will test site comparison studies between manufacturers' test sites and the Noise Enforcement Facility's test sites (7).

Assistance and guidance to State and local noise enforcement programs continues. Noise enforcement training courses for police officers, police academy training directors, and public health officers will be held; a guidebook for State and local prosecutors, a catalog of experts, and a "handbook" of State and local noise enforcement legal issues will be finalized and distributed. Direct assistance to individual State and local noise enforcement programs will be provided at the request of the individual agency through advice and assistance and through loan of the Mobile Noise Enforcement Facility (MoNEF). Also noise enforcement programs will assist the Office of Noise Abatement and Control (ONAC) in planning and implementing the new Quite Communities Act of 1978.

Enforcement regulations for noise emission standards for trash compactors and buses will be promulgated. An enforcement regulation for the proposed noise emission standard for pavement breakers and rock drills will be proposed. Also, the enforcement regulations for general labeling provisions and, specifically, a regulation for conducting administrative hearings under the regulations promulgated under the Noise Control Act will be promulgated.

The 1979 resources include approximately $376,300 for contracts. These resources are primarily for the continuation of the surveillance testing of regulated, in-use compressors and trucks; for continued technical support on the manufacture, marketing, and operation of compressors and trucks; for the development and implementation of a computerized noise emission data base for trucks and compressors; and for the development and presentation of a noise enforcement training package for public health officers and for obtaining expert assistance on State and local enforcement issues.

1979 Explanation of Changes from Budget Estimate

The net increase of +$88,900 results from two actions. First, an increase of +$57,000 is due to increased pay costs associated with the October 1978 (1979) pay raise and distribution of the October 1977 (1978) pay raise. Second, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$31,900 was reprogrammed to this element and is attributed to decreases in toxic substances enforcement activity.

1980 Plan

In 1980, the resources that are requested are $1,004,000 and 23 positions. This represents a decrease of $1,000 and an increase of one position over the 1979 resources. This will allow for a continuation of the activities that are undertaken in 1979 with a small increase in supporting State and local enforcement efforts. Of these requested resources, $249,800 will be used to continue the surveillance testing of in-use compressors and trucks and for efforts in providing assistance and guidance to State and local noise enforcement programs.

However, program resources will still be concentrated on the enforcement of new product noise emission standards for medium and heavy duty trucks and portable air compressors, because compliance with these regulations will provide the greatest environmental benefit, such as reduced levels of environmental noise and associated adverse impacts on the public health and welfare, for the resources expended.

Specifically, these resources will allow the Agency to review 880 manufacturers' noise production verification (PV) reports, to monitor and conduct 27 production verification tests and 20 selective enforcement audits, and to conduct 39 investigations of manufacturers' records to ensure that only complying products are distributed in commerce. Also, as necessary, EPA will conduct investigations of alleged noncompliance, prepare administrative orders, and participate in administrative hearings. EPA will also correlate manufacturers' noise testing facilities with its facility located at Sandusky, Ohio. The development of enforcement strategies and attendant regulations will continue in accordance with the schedule of controlled products developed by the Office of Noise Abatement and Control.

Assistance and guidance to State and local noise enforcement programs will be provided in two ways: (1) to individual programs that request assistance and guidance on specific issues and problems, and (2) by the development of training and guidance for State and local noise enforcement. Additionally, guidance on the field enforcement of the Federal labeling requirements will be prepared and distributed to State and local noise enforcement programs which want to ensure that the national Federal labeling program is successful in providing consumers with the noise generating or noise reducing properties of the products labeled under the Noise Control Act.

Interdisciplinary

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Research and Development.....					
Appropriation.	$12,761	$20,186	$20,393	$24,549	-$3,956
Permanent Positions. . .	98	158	174	168	- 6
Full-time Equivalency ..	...	...	261	296	+35
Abatement and Control					
Appropriation	5,496	4,404	4,413	28,553	+24,140
Permanent Positions . ..	126	114	87	76	-11
Full-time Equivalency ..	...	...	91	87	- 4
Total, Interdisciplinary Program:					
Appropriation	18,257	24,590	25,006	53,102	+28,096
Permanent Positions . ..	224	272	261	244	-17
Full-time Equivalency ..	..	...	352	383	+31
Outlays.....	31,503	27,080	41,900	44,200	+2,300
Authorization Levels....	43,273	*	46,285	*	...

*Authorizations are contained within amounts authorized for Federal Water Pollution Control Act. Clean Air Act, Solid Waste Disposal Act, Federal Insecticide, Fungicide, and Rodenticide Act, Safe Drinking Water Act, as well as certain portions by virtue of the Appropriation Act. In addition, funds are authorized in 1979 specifically under the Environmental Research, Development, and Demonstration Authorization Act of 1979. In 1980, authorizations have been proposed for the Research and Development activities.

OVERVIEW AND STRATEGY

Although many problems are best approached directly by specific media programs, effective management of environmental problems also requires cutting across the usual media lines when the problem, skill, or technique involved is not readily assignable to a specific medium. This interdisciplinary approach is consistent with the original concept behind the establishment of the Agency: an integrated organization to regulate pollution in all media and to assure that control measures applied to one media do not result in adverse impacts on other media. EPA applies this intermedia concept to those parts of the abatement and control and the research and development programs where the problems, tools, and results are multidisciplinary in nature.

The Scientific assessment program has principal responsibility for developing Agency guidelines for assessing carcinogenic, mutagenic and chronic risks, and exposure estimates. Responsibility for these functions has been placed in this program to assure that consistent approaches are developed for assessing pollutant impacts across all media and pollutants. In addition, the program is responsible for producing air and water criteria documents for use by regulatory offices. This criteria development function requires the integration of scientific information on a multimedia and interdisciplinary basis. It represents the end point of the ORD process, wherein results of many experiments must be synthesized and translated for use by regulatory decision makers.

The anticipatory research program, first identified as a separate effort in 1978, includes research to: (1) identify or characterize long-range problems which may be perceived but for which no specific regulatory action is currently planned; (2) support baseline studies which may require several years to complete; and (3) support basic environmental research. This program provides the scientific foundation for future work to solve specific problems and provides the scientific information necessary for future regulatory research.

The technical information program assures the effective dissemination of the products of the research and development programs to users within the Agency and throughout the public and private sectors.

In abatement and control the interdisciplinary portion of the environmental impact statement (EIS) program prepares EIS's and negative declarations for new source discharge permits. Other responsibilities include reviewing proposed actions by other Federal agencies that will affect the environment and assuring that other Federal agencies comply with pollution control requirements.

The consolidated grants initiative is a legislative proposal that will be sent to Congress in 1979. It proposes to reform Federal environmental assistance programs to State and local governments to encourage a "total" environmental approach. The initiative is designed to support comprehensive environmental planning and management, increased flexibility, and more efficient program administration. This request provides $25 million supplementary assistance awards to State and local governments in order to provide incentives and support for States that integrate their environmental programs. Other awards would be made to recognize good perfrmance and support special projects.

SUMMARY OF INCREASES AND DECREASES	(in thousands of dollars)
1979 Interdisciplinary Program.....	$25,006
Abatement and Control.....	+24,140
The net increase in the abatement and control program includes a reduction of $859,500 in environmental impact statements offset by an increase of $25 million in consolidated grants to initiate a new supplementary assistance program.	
Research and Development.....	+3,956
The requested net increase includes reductions in health and ecological effects ($2,597,700) reflecting the completion of the Consent Decree water quality criteria documents, and monitoring and technical support ($904,600) resulting from change of funding mode; offset by an increase in anticipatory research ($7,458,100) to fund research at new research centers, and expand support of continuing activities initiated in 1979.	
1980 Interdisciplinary Program	53,102

SUMMARY OF BUDGET ESTIMATE

1. Summary of Budget Request

An appropriation of $53,120,000 is requested for 1980. This request, by appropriation, is as follows:

Research and Development.....	$24,549,000
Abatement and Control.....	28,553,000

This represent an increase of $28,096,000 over the 1979 interdisciplinary program. The net increase results from a decrease of $859,500 for environmental impact statements; an increase of $25,000,000 for consolidated program grants; a decrease of $2,598,000 for health and ecological effects; a decrease of $905,000 for monitoring and technical support; and an increase of $7,458,000 for anticipatory research.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.....	$24,590
Congressional increases/decreases:	
Anticipatory research.....	-6,000
Flathead River study.....	+400
Poplar River study.....	+211
Effect of October 1978 pay raise partial absorption.....	+165
Proposed October 1978 pay raise supplemental.....	+219
Distribution of October 1977 pay raise..	+961
Office of Research and Development reprogrammings.....	+5,299
Headquarters and regional offices reprogrammings.....	-839
Current 1979 estimate.....	25,006

Congressional changes to the interdisciplinary net to -$5,389,000. A reduction of $6 million was applied to the anticipatory research program. An increase of $400,000 was provided for an environmental impact study of natural resource development in the Flathead River Basin, Montana. An increase of $211,000 was also provided for an environmental impact study of power plant operation on the Poplar River, Montana.

Pay raise costs result in a total increase of $1,345,000 over the original estimate. The agency request included all funds for the October 1977 pay riase in the management and support media, to be distributed to other media at a later date. The increase reflected represents the share of this later distribution.

Agencywide reprogrammings resulted in a net increase of $4,460,000 to the interdisciplinary media. The Office of Research and Development reprogrammed funds within their programs, primarily for the establishment of the Office of Health and Environmental Assessments, from toxic substances ($687,000); from water quality ($1,093,000); from solid waste ($576,000); from energy ($2,526,000); and from program support activities ($417,000). Other reprogrammings result in a transfer of $839,000 to the pesticides media.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations.....	$19,377	$27,559
Effect of October 1978 pay raise.....	+400	...
Effect of reprogrammings.....	+4,000	...
Program increases.....	...	+3,000
Consolidated grants.....	...	+25,000
Change in amount of carryover funds available..	+1,601	-2,553
Change in rate of obligation.....	+2,181	...
Total estimated obligations.....	27,559	53,006
(From new obligation authority).....	(22,962)	(50,962)
(From prior year funds).....	(4,597)	(2,044)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $400,000. The effect of all reprogrammings is an increase of $4 million.

The increase in budget authority requested in 1980 is expected to increase obligations by $28 million, of which $25 million is for consolidated grants.

The amount of carryover funds to be obligated in 1979 is $4,597,000, an increase of $1,601,000 over the 1978 level. In 1980, it is estimated that $2,044,000 of carryover funds will be obligated, a decrease of $2,553,000 from the 1979 level.

A change in the rate of obligation is expected in 1979, which would create an increase of $2,181,000 over the 1978 level.

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -	Page
			(dollars in thousands)			
Appropriation						
Health and Ecological Effects	$ 2,057	$ 2,457	$ 7,697	$ 5,099	-$ 2,598	I-7
Public Sector Activities.	1,368	25	...	...	...	I-10
Anticipatory Research . .	6,010	14,932	9,425	16,883	+ 7,458	I-11
Monitoring and Technical Support	3,326	2,772	3,471	2,567	- 904	I-16
Total	12,761	20,186	20,593	24,549	+ 3,956	
Permanent Positions						
Health and Ecological Effects	25	33	51	59	+ 8	
Public Sector Activities .	6	1	...	...	...	
Anticipatory Research . . .	40	93	92	85	- 7	
Monitoring and Technical Support	27	31	31	24	- 7	
Total	98	158	174	168	- 6	
Full-time Equivalency						
Health and Ecological Effects	...	...	88	119	+31	
Public Sector Activities . .	...	...	...	...	...	
Anticipatory Research	...	...	118	118	...	
Monitoring and Technical Support	...	...	55	59	+4	
Total	...	...	261	296	+35	

Purpose

The interdisciplinary research and development program includes three major components which address multidisciplinary and multimedia research. These are (1) Scientific Assessment, which provides guidance and review to the Agency's regulatory programs on evaluating the effects from exposure to pollutants and estimating the level of risk involved; and, in certain cases prepares risk assessments and criteria documents; (2) Anticipatory Research, which is designed to give the Agency an opportunity to get ahead of problems and to improve the basic quality of environmental science; and (3) Technical Information, which assures the effective dissemination of the products of the research and development program to users within the Agency and through out the public and private sectors.

nitrogen dioxide, started health assessments for two pollutants; perchloroethylene and ethylenedichloride; completed assessments for cadmium and polycyclic organic material; developed a special assessment document dealing with altitude as a factor in air pollution; and completed a background technical report on photochemical oxidants. The need for specific assessments are identified by the program offices and the completed products almost always are incorporated into Agency regulatory packages as supporting scientific information.

1979 Program

The 1979 resources for the scientific assessment program are $7,696,700 and 51 positions. Approximately $4,413,700 will be spent on contracts. The 1979 program is divided into two components, criteria and effects assessment and risk/exposure assessment.

The criteria and effects assessment activity is expanding to accommodate increased needs from the Agency's air regulatory program and a new initiative is being undertaken to start a criteria and assessment program to serve the Agency's needs in water quality.

The air criteria and effects assessment activity is increasing its work for the air regulatory program as compared to 1978. Specific work plans include: finishing air criteria documents for oxides of nitrogen and carbon monoxide; starting a criteria document for hydrocarbons; finishing health assessments for perchloroethylene, ethylenedichloride and cadmium; starting new health assessments for asbestos, haleothers, polynuclear aromatic hydrocarbons, and polycyclic organic material (multimedia), as well as for nickel, antimony and zinc. In addition, three special reports will be started and completed, including reports to Congress on sulfur emissions from mobile sources, health and welfare effects associated with particulates, and a special assessment of the acid rain problem.

A new water quality criteria program is being initiated in 1979. This program is being established to develop health and aquatic criteria for ambient water in response to provisions of the Agency's Consent Decree. During 1979, known human health and aquatic toxicologic data are being reviewed and interpreted with the objective of producing 65 criteria documents with a health and aquatic segment. These documents will be used to reevaluate the scientific basis for the Agency's water quality program. In addition to the 65 chemicals to be assessed, criteria documents for fifteen other pollutants are being prepared.

The other major segment of the scientific assessment program deals with risk assessment. In 1978, the CAG represented the only risk assessment activity. In 1979, this capability is being extended to include activities in reproductive effects assessment (mutagenic only) together with plans for a limited development of an exposure assessment capability.

In 1979 the CAG will continue to prepare risk assessments for certain program offices with primary attention to the needs of the Pesticide, Air Quality and Water Quality programs. A risk assessment is basically a review of toxicity data, in this case carcinogenicity data, with an analysis of the qualitative weight of evidence for carcinogenic potential and quantitative risk estimations that can be derived from the

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Scientific Assessment . .	$ 2,057	$ 2,457	$ 7,697	$ 5,099	-$ 2,598
Permanent Positions					
Scientific Assessment . . .	25	33	51	59	+ 8
Full-time Equivalency					
Scientific Assessment . . .	...	...	88	119	+31

Budget Request

The 1980 budget request for this program is $5,099,000 and 59 positions, a decrease of $2,597,700 and an increase of eight positions. The position increase will expand the existing Carcinogen Assessment Group. The $2,597,700 decrease reflects the completion of the Consent Decree water quality criteria documents and completion of an effort to develop guidelines for exposure analysis and assessment.

Program Description

The scientific assessment program provides the Agency's regulatory programs with a centralized capability for evaluating information on health and ecological effects from exposure to pollutants and estimating the level of health risk involved. The program is capable of reviewing known information about pollutant effects, interpreting this information, and producing scientific data summaries for subsequent risk assessment or other regulatory decision making. It is intended that the hazard assessment portion of the program will be responsible for maintaining consistency and quality among the risk assessments prepared throughout the agency. To insure this, the program will establish agency-wide guidelines and review completed assessments. In certain media, the program conducts risk assessments and prepares criteria documents itself. Typical outputs from the scientific assessment program include: Reviews, guidelines (including guidelines on exposure assessment), health criteria documents, aquatic effects criteria documents, health assessments, reports on special health/exposure situations and both preliminary and full risk assessments dealing with carcinogenic potential, as well as a new intiative dealing with mutagenic effects. Organizationally, the Carcinogen Assessment Group (CAG) and the Environmental Criteria and Assessment Office (ECAO) carried out the activities in 1978 with expansion slated for 1979.

1978 Accomplishments

In 1978, $2,056,800 was obligated of which $452,000 was spent on contracts.

In 1978, the scientific assessment program had two components; the Carcinogen Assessment Group (CAG), and a criteria and effects assessment activity which served the Air program requlatory office. The CAG developed guidelines for the evaluation of carginogenic potential and risk, performed risk assessments for the major EPA regulatory offices, reviewed assessments for some Agency program offices; and acted as a health policy advisor to the Agency. Approximately 90 guidelines and assessments were processed.

being reviewed and 45 new cancer risk summaries are being developed. Risk assessments from the Agency's Toxics program will be reviewed for both Section 4 and 5 substances and as many as 12 special problems of regional or enforcement significance are being assessed. Considerable effort is being devoted to improving existing Agency cancer policy guidelines both for the Air Quality program and the Interagency Regulatory Liaison Group (IRLG).

A Reproductive Effects Risk Assessment Group is being initiated in 1979 to develop guidelines and procedures for conducting risk analysis of mutagenic effects as a first priority. The new assessment activity will be modeled after the CAG in that methodologies for Agencywide use will be developed, followed eventually by an operational status in which reviews of assessments are conducted and assessments are developed as needed. This group will serve as the Agencywide quality control point for assessment of adverse reproductive effects and a center of expertise for the analysis of mutagenic effects.

Also in 1979, guidelines and methodologies for exposure assessment will be developed using Agencywide expertise. This activity would serve as the foundation for an exposure assessment group if, in the future, it was decided to be a useful initiative. The development of guidelines for Agencywide use will serve as a quality control mechanism for the Agency and serve to insure uniformity of scientific principle.

During 1979, the scientific assessment program within the Office of Research and Development will be institutionalized with the establishment of an Office of Health and Environmental Assessment (OHEA). A basic management framework is being established to oversee the expanding criteria development and health assessment/risk activities. Organizationally, OHEA incorporates the previously existing criteria and effects assessment program for air quality and the CAG, together with the new 1979 initiatives in criteria and effects assessment for water quality, exposure assessment and reproductive effects risk assessment. The formation of OHEA as a staff office in the Office of the Assistant Administrator for Research and Development is centralizing the ORD scientific assessment program and is in concert with recommendations of the National Academy of Sciences.

1979 Explanation of Changes from Budget Estimate

The net increase of +$5,239,700 results from several actions. A net increase of +$853,900 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan +$4,385,800 was reprogrammed to this activity from other media as follows: toxic substances ($686,700), energy ($2,355,400), water quality ($743,000), solid waste ($575,700) and interdisciplinary ($25,000). The resources were reprogrammed from other areas to establish the Office of Health and Environmental Assessments with two components: hazard risk assessment and criteria development-effects assessments.

1980 Plan

In 1980, $5,099,000 and 59 positions are requested for the development of scientific criteria and the assessment of health effects. Approximately $1,729,000 will be used for contracts. There is a increase of eight positions in this request which will enable an expansion of staffing the cancer risk assessment function of the scientific assessment program. The $2,597,700 decrease reflects the completion of the Consent Decree water quality criteria documents and completion of an effort to develop guidelines for exposure analysis and assessment.

establishment of a criteria development and effects assessment program for water quality, reproductive (mutagenic only) risk assessment and the establishment of an Office of Health and Environmental Assessment (OHEA) are continued in 1980. The development of exposure assessment guidelines in 1979 will be completed and the activity not continued in 1980.

The criteria development and effects assessment program has two distinct activities; one serving the Air regulatory program and one for the Water regulatory program. In air, activities will operate at a level similar to 1979 completing scientific criteria documentation started prior to 1980 and beginning documentation for pollutants nominated by the Air program office. Criteria documents for hydrocarbons, SOx and particulates will be completed in 1980 and four of seven existing criteria documents will be updated as required by the Clean Air Act. Assessments of pollutant effects will be initiated for about eight pollutants yet to be specified and one special regional problem will be evaluated. The report on acid rain will be completed and three other topics will be investigated and documented as special reports.

The water quality criteria development and effects assessment program will initiate criteria document development for 13 pollutants. These documents will include assessments of both human health effects and aquatic effects; together with risk assessments for certain pollutants to be selected from Appendix C of the Consent Decree. In addition, the pending promulgation of criteria documents for 36 Consent Decree pollutants due around January 1, 1980, will require a considerable review and update activity in early FY 1980.

In the risk/exposure assessment area, the CAG will be expanded in FY 1980 for a total of 19 positions. The increased, consisting of health science specialists will enable the CAG to increase its assessment outputs for the program offices. The estimation of risk for suspect cancer causing agents was the first risk assessment activity within the Agency. Virtually every regulatory office within the Agency has a requirement for assistance from the CAG. The larger staff will enable the CAG to increase its output of assessments and reviews to a level which is more in line with Agency needs. For the pesticides office, approximately 60 units of work will be developed including pre-RPAR risk evaluation, rebuttal review, slide reviews and full risk assessments. For the air quality program, 40 risk reviews will be developed and approximately 36 risk summaries developed in 1979 for the water quality program will be reviewed for regulatory purposes. In addition, the 13 new water quality assessments to be initiated in 1980 may require a cancer risk evaluation. Section 4 and 5 risk assessments performed by the Agency's Office of Toxics Substances will be reviewed for consistency of methodology and uniformity. These could number up to 49 documents. Risk assessments for approximately 23 pollutants in Drinking Water will be developed along with 12 special problem assessments for the Agency's regional offices.

The reproductive effects risk assessment (mutagenesis only) activity initiated in FY 1979 will be continued at a reduced level in 1980. As the first year's activity was primarily devoted to developing risk analysis guidelines for Agencywide use, FY 1980 will signal the start of a capability to review assessments for the mutagenic potential from exposure to specific chemical agents. All major regulatory programs of the Agency have a potential need for services of the mutagenic risk group.

The science of exposure analysis is complex with many unresolved issues and data gaps. The guidelines and methodologies developed in 1979 will serve as a basis for general Agency-wide exposure analysis and a foundation for future initiatives in exposure assessment with ORD.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Environmental Management .	$ 1,368	25	--	--	--
Permanent Positions					
Environmental Management . .	6	1	--	--	--
Full-time Equivalency					
Environmental Management .	...	...	--	--	--

Budget Request

There is no budget request for 1980.

Program Description

The objective of the environmental management research program was to develop and evaluate information and methods for environmental management and planning that address these shortcomings. The program was designed to provide regional planners and managers with methods to determine and evaluate alternative solutions to specific regional environmental problems. The research was divided into two major area:

(1) Comprehensive multimedia planning develops methods for use by planners which emphasize: (a) undertaking no more sophisticated planning analysis than is required to provide the information necessary to make decisions; (b) analyzing the socioeconomic impacts of management alternatives; and (c) assessing intermedia impacts.

(2) Incentives research develops and evaluates alternatives to existing regulatory approaches, particularly economic incentives, as means to accomplish environmental quality objectives.

1978 Accomplishments

In 1978, $59,100 was utilized for extramural contracts, $285,000 for grants, and $745,000 for interagency agreements. The program accomplishments included:

- A report on the study of the effect of different regulatory approaches in reducing emissions from stationary air pollutant sources will be completed March 1, 1979.

- Report on the effectiveness of effluent discharge permitting systems will be completed December 1979.

- Report on the feasibility of using economic incentives to insure compliance by stationary sources of hydrocarbons emissions will be completed by April 1980.

1979 Program

This program terminated in 1978.

1979 Explanation of Changes from Budget Estimate

The decrease of -$25,000 results from the reprogramming of this amount to scientific assessment within the interdisciplinary media.

Anticipatory Research

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Anticipatory Research . .	$ 6,010	$14,932	$9,425	$16,883	$+7,458
Permanent Positions					
Anticipatory Research	40	93	92	85	- 7
Full-time Equivalency					
Anticipatory Research	...	...	118	118	-

Budget Request

The 1980 budget request for Anticipatory Research is $16,883,000 and 85 positions. This represents a total increase of $7,458,100 and a net decrease of seven positions from the 1979 level. The dollar increase will fund research to be initiated at several new institutional research centers and will expand support for activities initiated in 1979 including acid rain.

Program Description

The National Academy of Sciences and the Office of Technology Assessment have previously expressed concern over the lack of long-term fundamental and anticipatory research in EPA. In addition, Public Law 95-155, Section 6(b) of the Research and Development Act of 1978 contains a Congressional request for EPA to examine alternative approaches for conducting long-term environmental research, recognizing the need to insulate such activities from the Agency's day-to-day regulatory pressures. The Anticipatory Research Program was initiated as the key mechanism by which the Agency addresses these concerns and takes action. The Program is designed to give EPA an opportunity both to get ahead of problems and to improve the basic quality of environmental science. To achieve these ends, the Program was organized in FY 1979 into three components with the following purposes:

- Innovative Research Program - Provides opportunities to individual scientists within EPA and the academic community to propose relevant research with long-range impacts or applicability. This component of the Program facilitates a "bottoms-up" planning approach for identifying fundamental and long-term research needs as related to EPA's overall mission.

- Center Support Research Program - Provides long-term support for exploratory research which provides the link between basic and applied research in key areas, e.g., in epidemiology and in groundwater research. Centers and their programs will have a multimedia orientation, to supplement our long-term research capability and shall provide support to all EPA laboratories whose activities are related to the center objectives. The intent of EPA in employing the Center mechanism is to integrate and build upon the expertise and resources of existing institutions. Support for moderate increases in staff facilities and equipment will be provided.

- Directed Research Program - It is expected that new problems identified within the Innovative Research Program and Center Support Program might grow into small multidisiciplinary programs. Likewise, programs once developed may eventually move into other components of the ORD program or be terminated if new knowledge determines that no serious problems exist. Moreover, these activities require broad interdisciplinary approaches that pool intellectual talent from within and

monitoring techniques and comprehensive epidemiological studies; (2) conducting a national assessment of the problems associated with acid rain; (3) developing methodologies for assessing environmental benefits of pollution control activities; and (4) developing an analytical capability to forecast/analyze emerging environmental problems resulting from societal changes.

1978 Accomplishments

In 1978 EPA transferred several existing programs into the Anticipatory Research Program. The following is a list of FY 1978 accomplishments within the program:

(1) In the area of chemical transformation, research in aquatic systems, exposure models, and laboratory procedures for predicting the pathways of potentially harmful chemicals in freshwater environments were developed and applied to nine chemicals associated with fossil fuel and to two agricultural pesticides:

The water/octanol partition coefficient was established as a reliable indicator of sediment/soil adsorption coefficients for a wide range of hydrophobic compounds;

Reproducible rate constants were determined for microbial hydrolytic transformation of toxic substances in waters representative of most of the United States; and

The photoreactivity of polynuclear aromatic hydrocarbons in water was established; and a field study on the fate of pentochlorphenol and a laboratory study on environmental transformations and fate of dichlorobenzidine was completed.

(2) In the area of integrated exposure research, a methodology was developed for the determination of mass balances for pollutants in an urban region. This method was applied to lead, zinc, cadmium and arsenic in the Los Angeles Basin:

Studies were completed on the effect of pH and selective organics on the H_2 oxidation rates of A. parodoxus, a candidate screening microorganism for determining the bioavailabilty of pollutants in soil systems;

An analytical methodology sensitive to 0.05 parts per billion was developed for dimethylnitrosamine, diethylnitrosamine, dipropylnitrosamine and N-nitrosomorpholine in animal tissue; and

Research aimed at determining the biosynthetic and chemical kinetics of formation of dimethylnitrosamine (DMN) and N-nitrosomorpholine was undertaken. Feeding of precursors to mice resulted in significant elevations of nitrosamines in their tissues.

(3) In the cancer research area, the First Annual Report of the Task Force on Environmental Cancer and Heart and Lung Disease was completed. This report presented an overview of the problem of environmentally related cancer and heart and lung disease. It also described the current Federal research devoted toward these problems:

A pilot study on the development and use of methodology for estimating ambient exposures to carcinogens and the development and field testing of an approach for epidemiologic study was completed;

Epidemiologic studies were initiated in California and New Jersey on the incidence of cancer as related to industrial emissions in heavily industrialized areas; and

rapid to suggest that vegetation may constitute an important sink for atmospheric benzene.

(4) In the area of biological sciences research, a field study has been completed revealing a direct relationship between body burden of heavy metals and petroleum and reduction of growth potential in marine mussels: and, in addition, methodologies were developed on the use of polychaete eggs and larvae as bio-indicators for assessing genetic effects of oil pollution on marine life.

1979 Program

The 1979 resources for Anticipatory Research are $9,424,900 and 92 positions. Approximately $2,370,000 will be spent on contracts, $3,107,000 on grants, and $325,000 on interagency agreements. The program provides support for each of the three following components:

Innovative Research - A competitive internal effort open to scientists and engineers in all ORD laboratories is being initiated in FY 1979. Projects reflecting fundamental and unique research ideas are being funded in the general areas of health and ecological effects, environmental chemistry and physics, new measurement techniques and advanced control technology approaches. Projects will be competitively selected with the advice and counsel of external scientists.

Center Program - Three institutional centers are being established in FY 1979 to conduct long-term studies. Research areas to be investigated include:

Epidemiology Center - The Center is responsible for fundamental research to develop new methodologies and improved statistical techniques, and the exploration of potential correlations between environmental pollutants and diseases such as cancer, emphysema, and hypertension. The Center is intended to enhance EPA's capability to examine the increasingly complex data and long-term problems of identifying pollution impacts on man.

Advanced Technology Center - The ability to adopt known treatment techniques to varying uses is being hampered by lack of understanding of the basic chemical, biological, and physical processes that govern treatment methods. This Center provides stable support for the long-term exploratory research necessary to produce needed basic knowledge, thereby improving the effectiveness of future treatment technologies.

Groundwater Center - A center is being established to support fundamental and long-term research on groundwater characteristics and the transport and fate of contaminants in soils and subsoils profiles. The center is integrated with EPA's Robert S. Kerr Environmental Research Laboratory, which has been designated as the lead EPA laboratory for groundwater research. It serves as a link between the Agency's scientists and those of the academic community. Initial studies will support EPA activities aimed at examining the Garber-Wellington aquifer in Oklahoma.

Directed Programs - The 1978 efforts of the Anticipatory Research Program are being continued in fiscal 1979 in the following areas:

- Cancer Assessment - The principle objectives of this program are to provide new information, i.e., profiles of known or suspect chemical carcinogens in the ambient air, drinking water, and food, and to assess the impact of environmental exposure to carcinogens upon the frequency of cancer occurrence in the general human population. (These profiles will serve to indicate if regulation will have to be proposed in the future). These objectives are being accomplished through comprehensive epidemiology studies coupled with extensive integrated exposure monitoring in areas demonstrating high cancer incidence or known exposures to excessive levels of environmental carcinogens. The 1979 program emphasizes the development of laboratory methodologies in the areas of biomonitoring, exposure assessment, demographic data collection, and identification of critical receptors.

and nitrates appear to have increased the acidity of precipitation in wide regional areas. In the northeast region of the nation, pH levels of 4.0 and lower have been recorded in rainfall. The objectives of this program are to determine the national scope and distribution of acid rain, the biological effects on natural, aquatic, forest, and agricultural ecosystems, and the atmospheric transport and transformation processes governing acid rain formation and distribution.

- Environmental Benefits - It is expected that the Agency will need improved capabilities to assess the benefits of future environmental protection measures. The objective of this program is to develop improved methodologies for determining the benefits of national and regional pollution control programs. Two studies to be completed in FY 1979 assess the national economic damages associated with air and water pollution. Other benefit research subjects for FY 1979 include determining the benefits of improved water quality at the regional level; benefits of improved visibility in Class I Western Federal areas; and estimates of soil damages resulting from particulates.

- Forecasting Environmental Problems - In FY 1979, planning activities will aim to identify existing environmental forecasting capabilities in the Federal government and industry. Agriculture and societal trends will be analyzed in order to identify candidate subjects for special studies. In addition, the Mussel Watch Program will continue developing methodologies and the use of marine bivalves as real world indicators and forecasters of pollution along all three of the Nation's coastlines.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$5,507,100 results from several actions. The Congress reduced this activity by -$6,000,000. A net increase of +$142,900 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, +$350,000 was reprogrammed to this activity from characterization and measurement methods development within the water quality medium to support National Bureau of Standards activities.

1980 Plan

The FY 1980 plan includes $16,883,000 and 85 positions, of which approximately $4,600,000 will be used for cooperative agreements. This is a $7,458,000 increase and a seven position decrease from the 1979 level: $2,000,000 for the Innovative Research Program; $2,650,000 for the Center Support Research Program; and $2,808,000 for the Directed Research Program. The plan will provide for a continuation of the long-term research conducted in FY 1979 within the three components of Anticipatory Research.

Innovative Research Program

The in-house effort will be expanded and an extramural program will be initiated. Projects will aim to support unique ideas for addressing long-term environmental problems. Internally, the program will seek to stimulate projects of a fundamental nature in the areas of health and technology to complement continuing research in the areas of chemistry, physics, and environmental biology. Four participants in the program will be backfilled with term appointments, or Interagency Personnel Act (IPA) appointments. Three positions previously utilized to enable laboratory managers to accomdate for the selection of personnel to the program will be eliminated. Representative areas to be supported extramurally include studies of the environmental implications and beneficial applications of recombinant DNA technology to environmental problems, the pollution effects on important and representative terrestrial wildlife and other species, and chemical fluxes, (particularly organics, nutrients, and metals) between mdeia.

The three centers established in FY 1979 will acquire full status with additional funding. Four additional centers will be established in FY 1980 in the following key areas:

- Integrated Exposure Monitoring - Develop approaches and principles to evaluate total multi-media exposure and determine human body burden levels over the long term. This center will complement the Epidimiology Center established in FY 1979.

- Ultimate Disposal - Develop fundamental understanding and conduct long-term studies of the transport, transformation, fate, and environmental effects of materials in waste applied to land.

- Intermedia Transport - Study the fundamental chemical and physical processes that result in exchange of pollutants from one medium to another with emphasis on land/atmosphere exchanges, natural emissions, and changes in large land areas.

- Integrated Water Shed - Develop a comprehensive ecological study of a water shed, to use as a prototype system for evaluating laboratory approaches.

Directed Research Programs

- Cancer Assessment - A major field effort will be conducted to determine and characterize the link between environmental exposure to carcinogens and the frequency of cancer incidence in the general population. An area with a known high incidence of cancer will be subjected to a comprehensive epidemiology case study coupled with an extensive integrated exposure assessment. Due to the latency in the expression of a cancerous disease state, a retrospective exposure model will be employed to assess historical exposure of the population to carcinogens. FY 1979 laboratory studies aimed at developing field methodologies will be continued but at a reduced level. Four positions will be reduced in the program with the added emphasis on field studies.

- Acid Rain - In FY 1980 increased emphasis will be placed on determining the biological effects of acid rain on soil, forest, and natural ecosystems. Expanded atmospheric chemistry studies will be conducted in support of modeling activities aimed at producing improved predictive models for nitric and sulfuric acids. Preliminary forecasts/analyses will be made on the productivity of the Nation's forest, agriculture, soil, and aquatic ecosystems in view of the upward trends in energy production and acid precipitation.

- Environmental Benefits - Studies will be initiated to determine benefits of improved visibility in eastern U.S. and prototype benefit analyses of Agency strategies will be expanded.

- Forecasting Activities - Three kinds of environmental forecasting activities initiated by the Office of Research and Development will be continued or expanded in FY 1980 under the Anticipatory Research Program. The first of these is the continued development of a system for projecting a set of environmental quality indicators to be used to identify future environmental problems. Design work beginning in FY 1979 will be continued in FY 1980. It is intended to improve and extend EPA's capability by upgrading existing data base and adding projections of other pollutants and a much wider range of environmental quality indicators. The second king of forecasting activity will be to expand EPA's capability to forecast the likely environmental effects of alternative regulatory approaches, other U.S. government actions, and the activities of other countries. Detailed analysis to identify and define the research needed to prepare the Agency for either preventing or dealing with these problems will be performed.

The third kind of forecasting tool, i.e., the use of bioindicators for monitoring pollution trends will be continued in FY 1980 through the Mussel Watch Program. Pilot projects similar to the mussel watch concept will be initiated for freshwater and terrestrial systems, thereby providing the basis for eventual monitoring "hot spots" on a nationwide basis.

Monitoring and Technical Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Technical Information . . .	$ 3,326	$2,772	$3,471	$2,567	-904
Permanent Positions					
Technical Information	27	31	31	24	-7
Full-time Equivalency					
Technical Information	...	...	55	59	+4

Budget Request

The 1980 budget request for technical information is $2,567,000 and 24 positions. This represents a total decrease of $904,600 and seven positions from the 1979 level. This reduction reflects a management shift from direct funding of some of the products of the technical information/technology transfer program (i.e. design manuals, technology capsule reports, symposia and manuals of practice) to supporting such efforts via the EPA program offices, the Regions and other user groups. Such direct funding by the ultimate consumer of technical information will assure its relevance while, at the same time, centralized funding of our technical information transfer capability will assure its quality.

Program Description

The technical information and technology transfer efforts assure the effective dissemination of the products of the research and development programs to users within the Agency and throughout the public and private sectors. This activity includes the publication and general distribution of scientific and technical reports, response to requests for specific information, and information dissemination whereby available information or technology is matched to the needs of officials who frequently do not possess a technical or scientific background. Specialized publications and symposia are also developed to be most useful and readily understandable to the targeted user. The program also provides coordination and support for such Congressionally mandated activities as the Small Wastewater Flows Information Clearinghouse and the annual EPA Research Outlook (Five-year Plan).

1978 Accomplishments

In 1978, a preliminary assessment and design was produced to speed the implementation of a Small Wastewater Flows Information Clearinghouse. In addition, the final design for a system to improve access to information on EPA's more than 2,500 active research projects was completed. The following publications were produced and distributed to the technical, industrial design and state and local environmental control audiences: the Industrial Handbook for Air Pollution Control, the Design Manual for Land Treatment of Wastewater, and the Design Manual for Landfilling of Sludge (developed in conjunction with the Office of Solid Waste). Major seminar series were presented throughout the United States and covered the following subjects: pretreatment of industrial effluents, treatment of small waste flows, control of pollution from irrigation return flows, pollution control in the asphalt industry, lake restoration (in conjunction with the Office of Water Programs), and biodegradation (in conjunction with the Office of Pesticides Programs).

In 1979, in response to a requirement written into the Clean Water Act Amendments of 1977, Section 104Q, a major new research grant is being funded to create the Small Wastewater Flows Clearinghouse. This Clearinghouse will provide a centralized source of information on pollution control alternatives for rural areas and areas where collection and treatment by conventional means is impractical. In addition, to improve access to and manageability of information on EPA's research projects, a system is being initiated in cooperation with the Smithsonian Science Information System to collect, assure the quality of and automate search and retrieval of data on EPA's more than 2,500 active research projects.

The Technical Information Program continues to provide tailored publications, manuals and symposia for its user community, and is shifting toward greater reliance on the EPA Regions and Program Offices for the selection of topics, information formats and, to a growing extent, for resources. In addition, the Research Highlights and Research Outlook reports are being produced for Congress. A manual on sludge control is being produced and a number of symposia will be held to focus on innovative/alternative municipal wastewater treatment technologies and industrial wastewater pretreatment.

1979 Explanation of Changes from Budget Estimate

The net increase of +$699,600 results from several actions. A net increase of +$111,500 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan +$588,100 was reprogrammed to this activity from flue gas particulate control within the energy medium ($170,400) and from Research and Development program support ($417,700).

1980 Plan

In 1980, $2,567,000 and 24 positions are requested for the Technical Information Program of which $752,000 will be spent on contracts. This is a decrease of $904,600 and seven positions. Most of the above decrease results from a planned program management change which will shift from direct funding of some technology transfer activities (i.e., design manuals, technology capsule reports, symposia and manuals of practice) within the technical information program to supporting such efforts via resources from the EPA regulatory program offices, the Regions and other user groups. Direct funding of our technical information program will be used to maintain a centralized capability and provide quality control.

Such Congressionally mandated requirements as the Small Waste Flows Information Clearinghouse and the EPA Research Outlook/Five-year Plan will be fulfilled. Centralized control of ORD publications management/distribution and of ORD conferences will continue, and the Research Highlights summary report, publications bibliography and program guide will be produced. In addition, the quality control function for the research project status system that allows direct access to information concerning the 2,500-plus active EPA research projects will continue.

A centralized capability will be maintained to assure adequate quality control over, and improve the efficacy of, resources expended for design manuals, conferences, symposia, manuals of practice, technology summary reports, and other technology transfer activities intended to communicate the latest technological information to the State and local officials and design engineering community.

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
			(dollars in thousands)			
Appropriation						
Environmental Impact Statements	$$5,496	$4,404	$4,413	$$3,553	-$860	I-19
Integrated Environmental Assistance	...	...	...	25,000	+25,000	I-23
Total	5,496	4,404	4,413	28,553	+24,140	
Permanent Positions						
Environmental Impact Statements	126	114	87	76	-11	
Integrated Environmental Assistance	...	...	...	...	...	
Total	126	114	87	76	-11	
Full-time Equivalency						
Environmental Impact Statements	...	...	91	87	-4	
Integrated Environmental Assistance	...	...	...	...	...	
Total	...	...	91	87	-4	

Purpose

The National Environmental Policy Act of 1969 requires Federal agencies to prepare environmental impact statements (EISs) on major actions significantly affecting the quality of the human environment. This EIS requirement applies to new source discharge permits issued by EPA. Section 309 of the Clean Air Act requires that EPA review proposed actions of other Federal agencies to assure that they do not adversely affect the quality of the environment. Executive Order 12088 requires that all Federal agenices comply with Federal, State, interstate, and local substantive standards and limitations for prevention and control of environmental pollution. EPA's Federal facilities compliance program is designed to assure compliance with these requirements.

The consolidated grants initiative is a legislative proposal that will be sent to Congress in FY 1979. It proposes to reform Federal environmental assistance programs to State and local governments to encourage a "total" environmental approach. The initiative is designed to support comprehensive environmental planning and management, increased flexibilty, and more efficient program administration. This request provides $25 million for this proposal. Supplementary assistance awards will be made by the Agency to State and local governments in order to provide incentives and support for States that integrate their environmental programs. Other awards would be made to recognize good performance and support special projects.

Abatement and Control

Environmental Impact Statements

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Federal Activities/EIS Review (Air)	$ 812	$ 540	$ 613	$ 453	-160
Federal Activities/EIS Review (Water).	1,679	1,500	1,443	1,364	-79
New Source EIS Preparation	3,005	2,364	2,357	1,736	-621
Total	5,496	4,404	4,413	3,553	-860
Permanent Positions					
Federal Activities/EIS Review (Air)	31	24	22	17	-5
Federal Activities/EIS Review (Water).	62	75	53	47	-6
New Source EIS Preparation	33	15	12	12	...
Total	126	114	87	76	-11
Full-time Equivalency					
Federal Activities/EIS Review (Air)	...	...	24	22	-2
Federal Activities/EIS Review (Water).	...	...	55	53	-2
New Source EIS Preparation	...	...	12	12	...
Total	...	...	91	87	-4

Budget Request

The budget request for this subactivity is $3,553,300 and 76 positions. During 1979, program activities will focus on the review of other Federal agency environmental impact statements (EISs), regulations and other proposed actions; preparation of new source EISs and negative declarations; and on Federal facilities compliance.

Program Description

Executive Order 12088 requires that all Federal agencies comply with Federal, State, interstate, and local substantive standards and limitations for prevention and control of environmental pollution. EPA's activities include monitoring Federal facilities, providing technical assistance, reviewing compliance strategies and budget requests for pollution abatement measures, and taking enforcement action as necessary to assure compliance with environmental laws.

quality of the environment. The review activity at EPA consists of reviews of Federal agency EISs and actions, pre-draft and pre-final liaison, technical assistance, and referrals to the Council of Environmental Quality.

The National Environmental Policy Act requires that all agencies of the Federal government prepare detailed EISs on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. The new source NEPA compliance activity at EPA includes complete environmental reviews, preparation of either an EIS or negative declaration, evaluation of alternatives to proposed actions, and mitigation measures to prevent adverse environmental impacts.

FEDERAL ACTIVITIES/EIS REVIEW (AIR)

1978 Accomplishments

In Federal facilities compliance, primary emphasis was placed on ensuring adherence to consent declarations and delayed compliance orders by noncomplying facilities. Increased efforts were directed toward improving the effectiveness and timeliness of air new source reviews and coordination with the EIS review process. The major emphasis was on EPA assistance to other Federal agencies in order to integrate effective environmental planning with basic programmatic decision-making processes on major energy, transportation, and other development projects that might cause environmental harm. Approximately 2,200 draft and final EISs, as well as 100 proposed Federal agency regulations and other proposed Federal actions, were reviewed for air quality impact. Revised EIS review guidelines on highway projects were also drafted.

1979 Program

Federal activities and EIS review is allocated $613,000 and 22 positions in the 1979 plan.

In Federal facilities compliance, primary emphasis will continue to be placed on negotiating delayed compliance orders with noncomplying Federal facilities and identifying pollution control problems and funding needs to ensure adherence to the July 1979 statutory deadline. The increased State role under the Clean Air Act Amendments of 1977 will necessitate substantial EPA interaction with the States. No significant change in the regional EIS review activity from the current year is anticipated. The major regional emphasis will be on pre-draft EIS liaison and pre-final EIS consultation. Revised EIS review guidelines on highway projects will be finalized and issued. Work will begin on EIS review guidelines on airports.

1979 Explanation of Changes from Budget Estimate

The net increase of +$72,900 results from two actions. An increase of +$60,000 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as part of the agency's ZBB review of resource requirements for its FY 1979 operating plan +$12,900 was reprogrammed to this element from Federal activities/EIS reviews-water quality.

1980 Plan

The budget request for Federal activities and EIS review is $453,300 and 17 positions, a decrease of $159,700 and five positions. All this work will be performed intramurally.

In Federal facilities compliance, primary emphasis will be placed on identification of problems, encouragement of funding and enforcement actions as necessary. The major regional emphasis will be on the reviews and pre-draft EIS liaison and pre-final EIS consultations.

1978 Accomplishments

In Federal facilities compliance, emphasis was on new source review and on review of self-monitoring reports to ensure adherence to permit requirements. In addition, efforts continued to focus on early identification of needed pollution abatement projects to ensure inclusion in Federal agencies' budget proposals. Approximately 2200 draft and final EISs, as well as over 100 proposed Federal agency regulations and other proposed Federal actions, were reviewed for water quality impact. Pre-draft EIS liaison was emphasized where a series of projects had significant cumulative effects on a large area. Emphasis was also placed on preventing and mitigating water quality degradation from energy development, water resources development, and urban development.

1979 Program

Federal activities and EIS review is allocated $1,442,500 and 53 positions in the 1979 plan.

In Federal facilities compliance, emphasis will also be placed on bringing enforcement actions against major violators. Emphasis will be on helping Federal agencies budget for pollution abatement projects. This procedure involves preparing a report to OMB each year identifying needs etc. No significant change in the regional EIS review activity from the current year is anticipated. The major regional emphasis will be on pre-draft impact statement liaison and pre-final impact statement consultation. Work will begin on EIS review guidelines for nuclear power plants, impoundments, and channelizations.

1979 Explanation of Change from Budget Estimate

The net decrease of -$57,500 results from two actions. An increase of +$144,100 is due to increase pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$201,600 was reprogrammed from this element to Federal activities/EIS review - air ($12,900) and to pesticides use management ($188,700).

1980 Plan

The requested resources in this program are $1,364,000 and 47 positions, a decrease of $78,500 and six positions. This work will be performed intramurally.

In the Federal facilities compliance program, emphasis will be placed on identification of problems, encouragement of funding, and enforcement actions as necessary. Certain major sources will be inspected to assure adherence to compliance schedules. In the EIS review program, the major regional emphasis will be on the reviews and pre-draft EIS liaison and pre-final EIS consultation.

1978 Accomplishments

Over $1.6 million of the 1978 resources was used for extramural funding. A total of 11 EISs, both drafts and finals, were filed on water new source discharge permits. In addition, a total of 54 negative declarations were filed. Technical guidelines on three industries were finalized and three industrial guidelines were drafted.

1979 Program

New source EIS preparation is allocated $2,357,300 and 12 positions in 1979 plan, including approximately $2.0 million for extramural funding.

Several additional States will assume the National Pollutant Discharge Elimination System program, however they are not expected to be States with any significant new source construction activity. Technical guidelines on seven industries will be finalized and nine others drafted. Two areawide studies on coal mining and energy-related industries will be completed. Approximately the same number of EISs will be prepared as in 1978.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$6,900 results from several actions. Congress provided an add-on of +$611,000 for two environmental impact studies; $400,000 for a study of natural resource development in the Flathead River Basin, Montana and $211,000 for a study of power plant operation on the Poplar River, Montana. An increase of +$32,700 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. Finally, as a result of the agency's ZBB review of resource requirements for its 1979 operating plan, -$650,600 was reprogrammed from this element to pesticides use management.

1980 Plan

The requested resources in this program are $1,736,000 and 12 positions, a decrease of $621,300. $1.4 million is included for extramural funds.

Approximately the same number of environmental impact statements are expected to be filed as in 1978 and 1979. Technical guidelines on 10 industries will be finalized.

Integrated Environmental Assistance

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Integrated Environmental Assistance.....	...	...	...	$25,000	+$25,000
Permanent Positions					
Integrated Environmental Assistance.....	...	...	...	...	...
Full-time Equivalency					
Integrated Environmental Assistance.....	...	...	...	...	...

Budget Request

The resources requested for this budget subactivity are $25,000,000 to initiate a new program of supplementary assistance for integrating assistance awards and providing incentives for superior performance and program innovations. No new positions are requested for this activity because the work will be accomplished with personnel working with the various grant programs involved.

Program Description

This supplementary assistance is in support of a major new Administration legislative proposal, the Integrated Environmental Assistance Act of 1979, to be forwarded to Congress in FY 1979. The supplementary assistance includes funds to:

- Provide an incentive to States to deal with cross-media implications by consolidating their environmental efforts under the Integrated Environmental Assistance legislative proposal,
- Provide the Agency with the ability to support grantees demonstrating extraordinary environmental initiative,
- Provide necessary support for developing State and local capacity to integrate the management of their environmental programs, and
- Provide the Agency with the ability to support and encourage special innovative projects (as was provided for the Connecticut civil penalities program).

to obtain EPA nonconstruction grant assistance. It is a voluntary option for State and local governments. It is designed as a way to support integration of the various elements of a "total" environmental program by combining comprehensive environmental planning, implementation, and management. The proposal allows State and local governments increased flexibility to determine environmental protection priorities and allocate resources. The proposal will also promote simpler and more efficient program administration.

The legislative proposal is important to help accomplish the integration of environmental programs and concerns for which EPA was created. EPA has experimented with consolidating grant programs administratively, but legislative constraints limited the potential of this administrative effort, further emphasizing the need for a legislative approach.

1978 Accomplishments.

During FY 1978, the Agency developed a draft legislative proposal following an extensive development phase which involved meetings in three regions with State and local representatives, and active participation by public interest groups.

1979 Program

In FY 1979, the Administration will submit the Integrated Environmental Assistance legislative proposal to Congress. The proposal is likely to get multiple referrals in Congress because of the array of committees concerned with EPA programs. The Administrator will publish regulations with 180 days of passage. Simultaneously, Agency regional office staff will work closely with State and local officials to prepare to implement the program in FY 1980.

1980 Plan

During FY 1980, the regional office staff will assist State and local officials in preparation of integrated plans. These plans will be reviewed for inclusion in the program. State and local governments with approved integrated environmental plans are eligible for a portion of the $25,000,000 supplementary assistance. The applications will be reviewed by the Administrator and awards will then be made.

Toxic Substances

TOXIC SUBSTANCES

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Research and Development:					
Appropriation.....	$8,861	15,709	14,825	33,977	+$19,152
Permanent Positions....	42	61	61	92	+31
Full-time Equivalency..	...	...	92	136	+44
Abatement and Control					
Appropriation.....	11,582	41,598	40,970	65,543	+24,573
Permanent Positions....	199	428	425	553	+128
Full-time Equivalency..	...	...	412	549	+137
Enforcement:					
Appropriation.....	1,250	4,630	3,156	3,796	+640
Permanent Positions....	31	85	70	78	+8
Full-time Equivalency..	...	...	75	82	+7
Total, Toxic Substances Program:					
Appropriation.....	21,693	61,937	58,951	103,316	+44,365
Permanent Positions...	272	574	556	723	+167
Full-time Equivalency.	...	...	579	767	188
Outlays.....	12,090	27,200	34,300	70,400	+36,100
Authorization Levels..	22,325	17,700	30,482	*	

* Authorization pending.

OVERVIEW AND STRATEGY

The Toxic Substances Control Act (TSCA) establishes a program with the objectives of insuring that adequate data are developed with respect to the effects of chemical substances and mixtures on health and the environment and that those chemicals which present an unreasonable risk of injury to health or the environment are regulated to reduce their risk. The Act's coverage is broad, encompassing as many as 65,000 chemicals currently in commerce with up to 1,000 additional new chemicals introduced each year. About 115,000 manufacturers and processors are subject to the Act.

The major programs EPA must develop and implement to carry out the provisions of the Act are those to: (a) require testing of chemicals and submission of reports of existing information by industry and review these and other data to determine chemical hazards; (b) review and act on new chemical and significant new use notifications by industry and control the manufacturing, processing, distribution, use and disposal of existing chemicals that pose unreasonable risks to health and the environment; (c) enforce these statutory and regulatory programs; and (d) conduct research and development to support the implementation of the law.

There was a limited organizational and conceptual base upon which to build the toxic substances program when the law was first enacted. Consequently, the first years of implementation have had the development of the foundations for program operation as a major accomplishment. We have established and begun staffing the organization to carry out the program. At the same time we have arrived at the initial approaches to many basic program functions and have taken selected actions where warranted.

Some of the major base programs that we have begun to put in place include a scheme of test standards and its use for chemical test regulations; a multistage assessment process for reviewing suspect chemicals to determine potential risks; the first control regulations on chemicals posing unreasonable risks; the premanufacture review program with the initial regulations, forms, and other supporting documents; basic data management facilities and operations; approaches for using reporting requirements for information gathering and mechanisms for setting priorities for action; enforcement policies and procedures for inspections, hearings, penalties, emergency actions, and imports; reorientation of existing research to toxic substances; and a basic plan for toxic substances research.

Many of these foundation building elements will continue into the next years, with an evolution of these basic program approaches and more extensive implementation of them, resulting in an appreciable increase in associated outputs (i.e., chemical control regulations, test standards, reporting requirements, etc.). Of course, staffing and organization, particularly of required scientific skills, will remain a key element in this beginning operational phase.

The 1979 and 1980 programs will reflect this move into operation for most program areas, but to varying degrees. Many elements of the toxic substances program are interrelated and their implementation must be carefully balanced and staged. In order for the overall program to continue operation in future years, certain long lead time activities must be started at a high level. The time required successively to implement testing requirements, have industry develop the data, evaluate the potential hazards, and take appropriate control action for particular chemicals may extend over several years. In addition, the program has presently been operating on an established information base carried over from previous years. This backlog of information will be rapidly used up and will have to be replenished. For these reasons, the testing and evaluation of chemicals continue to receive major emphasis in order to establish an adequate information and assessment base upon which to take actions now and in the future under TSCA and other toxics related programs.

Another key operational program will be the review of industry notifications before the manufacturing of new chemicals in order to assess their risks and take appropriate action. Premanufacture review will begin during 1979 and will be fully operational in 1980. The nature of this program as one of the Agency's major preventive health programs necessitates that adequate emphasis be placed on it to insure protection from risks before they are posed.

Control actions will be taken on a selected number of chemicals expected to be identified in these first years of operation as posing unreasonable risks. Nonregulatory approaches, such as information dissemination and informal discussion, will also be used when appropriate to effect protection from potential risks. Adequate economic analysis, information planning and reporting, information systems and services, and monitoring support will be provided to these high priority programs. The implementation and operation of information systems enabling us to enter, sort, and retrieve available data; track submissions; refer to data sources in other systems; and conduct analyses will be emphasized to improve the program's efficiency and effectiveness. The program will rely extensively in all areas on other programs and agencies to take action when appropriate, and to establish coordinated approaches to problems, as the Act requires.

The toxic substances enforcement program is responsible for protecting public health and the environment from risks posed by chemical substances through enforcement of TSCA and its implementing regulations.

In 1980, emphasis will be focused on compliance monitoring of existing chemical control regulations (PCB Marking and Disposal, PCB Ban and Chlorofluorocarbon Ban), and initiation of appropriate TSCA enforcement actions in response to toxic chemical emergency situations. Enforcement efforts will also be directed toward limited compliance monitoring and enforcement of chemical testing, new chemical notification, chemical reporting, and chemical import regulations. Technical and legal support will be provided to the regions in major enforcement actions.

The 1980 research and development program contains a new initiative designed to advance markedly our ability to define and predict human exposures to toxic chemicals that are released or escape into the environment. The program seeks to provide better answers to the following questions:

- If a toxic substance enters the environment, is it likely to reach humans and, if so, by what pathways--air, water, soil, or food?

- To how much of the substance will man be exposed as a result of his pattern of behavior, e.g., food habits, mobility, and occupational activity?

- If multiple sources or pathways of a toxic substance contribute to human exposure, what is their relative significance and which, if reduced or controlled, would result in the greatest reduction of exposure?

The 1980 research will comprise the first year of a 5-year program aimed directly at the gaps in knowledge and methods which preclude us at this time from providing answers to these questions which are necessary for anticipated regulatory analyses.

In addition to the 1980 program on human exposure, EPA will conduct research to provide validated protocols for testing the environmental hazards of toxic chemicals in support of Sections 10(c) and 10(e) of TSCA.

Also included in the research program are provisions for the improvement of methods of measurement, identification, collection, and separation of selected toxic chemicals in the air, and, to a limited extent, in water and sediments. This area of the research program provides data on exposure levels of toxic chemicals to be used in risk assessment and validation of exposure models.

Additional work in the program will be in support of a moderate expansion of efforts to identify and document the nature and extent of toxic burden in the environment, including the adaptation of measurement and monitoring techniques to specific toxic substances.

The 1980 program will, in addition to health and ecological effects and monitoring and technical support research areas, provide funding for (a) assessments of alternative processing routes and in-process modifications required to minimize production of toxic contaminants in chemical feedstocks, intermediates, and products, and (b) development of a "new" chemical manufacture predictive model based on the unit process approach.

SUMMARY OF INCREASES AND DECREASES	(in thousands of dollars)
1979 Toxic Substances Program.....	$58,951
Abatement and Control.....	+24,573

The increase is to make the TSCA implementation program more fully operational. It will allow expanded development of testing requirements and conduct of assessments to provide an adequate information base for present and future actions. The increase will provide for a fully operational new chemical review program and for action on identified existing chemical risks. Adequate information gathering and management, monitoring and economic analysis support for these programs will be provided.

	(in thousands of dollars)
Enforcement.....	+640
Increased resources are for the enforcement of TSCA, emphasizing responses to emergencies involving substantial threats to public health and safety including inspections and legal actions; preparation and execution of enforcement strategies to enforcement regulations to control specific chemical substances and mixtures; and the improvement of enforcement methods through greater cooperation with States and Federal agencies.	
Research and Development.....	+19,152
The increase reflects a major new integrated research approach to assessing total human exposure to, and adverse health effects from, toxic substances. Preventive public health research activities, contained in both the health and ecological effects research, focus on the development of short-term screening tests; the development of predictive models for total body burden; the refinement of neurotoxicologic detection methods and new work on evaluative laboratory techniques. The increase in the ecology program will support research initiatives focused on predicting the movement and fate of toxic substances.	
1980 Toxic Substances Program.....	103,316

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An Appropriation of $103,316,000 is requested in 1980. This request, by appropriation account, is as follows:

Research and Development.....	$33,977,000
Abatement and Control.....	65,543,000
Enforcement.....	3,796,000

This request represents an increase of $44,365,000 over the 1979 level. The primary increase is for toxic substances strategies ($24.6 million) and reflects implementation of a more fully operational TSCA program. These resources will permit expanded development of testing requirements and conduct of assessments to provide an adequate information base for present and future actions under TSCA and other toxics related programs. The program for review of and action on new chemical notifications will become fully operational. Enforcement activities will increase by $.6 million, emphasizing responses to emergencies involving substantial threats to public health and safety including inspections and legal actions. Research and development activities will increase by approximately $19.2 million primarily in health and ecological effects ($17.4 million) and in industrial processes (1.2 million) to emphasize preventive public health research activities.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.....	$61,937
Congressional increases/decreases:	
Contractual services and monitoring and technical support.....	-410
Reduction in lapse rate.....	-733
Effect of October 1978 pay raise.....	-107
Proposed October 1978 pay raise supplemental.....	+341
Distribution of October 1977 pay raise..	+274
Office of Research and Development reprogramming.....	-687
Headquarters and regional offices reprogramming.....	-1,664
Current 1979 estimate.....	58,951

Congressional changes to the toxic substances media include a reduction of $410,000 for research contracts and monitoring and technical support and a decrease of $733,000 as a result of the $3 million reduction applied to the lapse rate in filling positions of the Abatement and Control and Enforcement appropriations.

Pay raise costs result in a total increase of $508,000 over the original estimate. The agency request included all funds for the October 1977 pay raise in the management and support media, to be distributed to other media at a later date. The increase reflected represents the share of this later distribution.

Agencywide reprogrammings resulted in a decrease of $2,351,000. The Office of Research and Development reprogrammed $687,000 to the interdisciplinary media; other reprogrammings reflect a transfer of $236,000 to pesticides; $32,000 to noise; $837,000 to water quality; and $523,000 to program management.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations.....	$21,693	$60,388
Effect of congressional changes.....	-200	...
Effect of October 1978 pay raise.....	+250	...
Effect of reprogrammings.....	-2,000	...
Program increase.....	+35,000	+42,000
Change in amount of carryover funds available.....	+5,645	-1,437
Change in rate of obligation.....	...	+5,000
Total estimated obligations.....	60,388	105,951
(From new obligation authority).....	(53,152)	(100,152)
(From prior year funds).....	(7,236)	(5,799)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

Congressional changes as discussed in the previous section result in a decrease to obligations of $200,000. The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $250,000. The effect of all reprogrammings is a decrease of $2 million.

The increase in 1979 budget authority over the 1978 level will increase obligations by $35 million. In 1980, the increased budget authority will result in additional obligations of $42 million.

The amount of carryover funds to be obligated in 1979 is $7,735,000, an increase of $5,645,000 over the 1978 level. In 1980, it is estimated that $6,298,000 will be obligated, a decrease of $1,437,000.

A change in the rate of obligation is expected in 1980, which would create an increase of $5 million over the 1979 level.

PROGRAM LEVELS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Test standards initiated, proposed, final.....	4	...	25	37	+12
Chemicals subject to proposed/ final testing requirements.....	...	...	40	90	+50
Evaluations of new chemical notifications.....	...	...	110	275	+165
Preliminary assessments undertaken.....	277	...	350	375	+25
Final risk assessments undertaken.....	2	...	7	10	+3
Control actions on existing chemicals proposed/final.....	3	...	4	6	+2
New chemical notifications processed.....	...	...	200	400	+200
Control actions on new chemicals taken.....	...	...	3	9	+6
Recordkeeping & reporting actions taken.....	3	...	41	51	+10
Literature searches for assessment and testing conducted.....	15	...	171	178	+7
Material balance studies for assessment conducted.....	...	...	16	54	+38
Inspections of facilities subject to Section 6 rules.....	...	...	484	594	+110
Inspections of facilities subject to Section 5(e) and (f) rules.....	...	...	...	5	+5
Inspections of facilities subject to Sections 4, 5, 8 and 13 requirements.....	...	...	31	43	+12
Cases/prosecutions initiated or supported (Headquarters and Regions combined).....	...	...	103	134	+31
Criminal cases, civil penalty appellate review cases initiated or supported.....	...	...	3	7	+4

Research and Development

other organonitrogen toxicants. The activity focused on: (1) chemical process evaluation with emphasis on feedstock, intermediate, co- and by-product and final product compositions; (2) substitute production methods; (3) in-process toxic pollutant control; and (4) the evaluation of techniques with a potential for recovery, recycle and reuse of residuals for total plant control of toxic materials.

1979 Program

There are 8 positions and $452,400 allocated to this program. Of this amount it is estimated that $100,000 will be expended through contract efforts and $75,000 for grants. The FY 1979 industrial process toxics program will focus upon the following activities:

- Technical assistance on specific pollutant identification/prediction and assessment of specified industrial processes to the Office of Toxic Substances, Office of Enforcement, Office of General Counsel, and other EPA operating program offices, including regional offices.

- Documentation, for Agency reference, of summaries of industrial R&D experiences regarding in-process changes for TSCA priority chemicals.

- Definition of alternative processing routes and modifications to minimize public exposure to toxic substances that result from the manufacture of:

  (1) Two specific high volume organonitrogen chemicals in which the potential for nitrosamine occurrence is high, both in the product and in waste streams; and

  (2) one specific high volume halogenated hydrocarbon (e.g., vinylidene chloride, hexachlorobenzene, hexachlorocyclopentadiene) in which the potential for environmental contamination is high during manufacture.

1979 Explanation of Changes from Budget Estimate

The net increase of +$12,400 results from increased pay costs from the October 1978 FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

1980 Plan

The requested FY 1980 resource level for this subactivity is $1,742,000 and 12 positions. Of this amount it is estimated that $900,000 will be expended in contracts and $200,000 in grants. The $1,289,600 and four position increase in FY 1980 resources is the response to an OTS need to expand significantly the "new" chemical manufacture predictive model based on the unit process approach. Such a model will provide the Agency with a source of industrial information concerning chemicals, their manufacturing process, distribution and use patterns, waste disposal methods, and control options, together with a viable analytical model to predict human risk and how the chemical product moves through Commerce. Specifically, the program will provide:

- Expansion of toxic pollutant identification analyses for three to seven products including feedstocks and intermediates. Development of product flow diagrams for specific OTS priority chemicals.

- Significant expansion of "new" chemical manufacture predictive model to identify: (a) anticipated processes involved in manufacture, commercial and consumer use, transportation, and disposal; (b) expected releases associated with individual processes; (c) quality and quantity of releases; (d) recommended control methods; and (e) risk analyses relative to feedstocks, byproducts, impurities, and degradation products.

- Expansion of regional technical support to include toxic chemical spills and emergency response techniques.

TOXIC SUBSTANCES

Research and Development

Monitoring and Technical Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Characterization and Measurement Methods Development.	$ 88	$ 790	$ 592	$ 637	+ $ 45
Technical Support	465	2,445	1,734	2,201	+ 467
Total	553	3,235	2,326	2,838	+ 512
Permanent Positions					
Characterization and Measurement Methods Development.	-	5	3	3	...
Technical Support	19	18	18	18	...
Total	19	23	21	21	...
Full-time Equivalency					
Characterization and Measurement Methods Development.	...	...	5	6	+1
Technical Support	...	...	26	23	-3
Total	...	...	31	29	-2

Budget Request

An appropriation of $2,838,000 and 21 positions is requested for FY 1980. This is a net increase of $512,100 over 1979 level. Of this increase, $46,000 will allow initiation of work on the development of measurement methods development for toxics in sediments and $466,000 will support a moderate expansion of efforts to identify and document the nature and extent of toxic burden in the environment, including the adaptation of measurement and monitoring techniques to specific toxics.

Program Description

The Characterization and Measurement Methods Development program is designed to provide improved methods for collection, separation, identification and quantification of toxic substances in the environment. The program scope includes air, water and soils/sediments. Primary emphasis for 1979 and 1980 will be on airborne toxic organics and, to a very limited extent, on toxics in soil-sediments and water. This program will also provide exposure data on toxic chemicals to be used in the validation of exposure models for risk assessment of toxic chemicals under TSCA.

The Technical Support Program for Toxics currently focuses on providing support to the Office of Toxic Substances (OTS). As a new Agency program and operating office, OTS has not yet developed a suitable data collection capability either in-house or extramurally. Moreover, at present, there is only a limited extramural capability that can be drawn upon. Accordingly OTS will require substantial support from ORD in adapting and applying advanced state-of-the-art measurement, monitoring and analyses techniques to specific toxic compounds. During FY 1980, ORD's support will assist the OTS in : (1) identifying the nature, source, and extent of toxic pollution; (2) extending the mass spectral search capability to cover some 25,000 materials for which spectra are needed;

As the program matures and OTS's capabilities develop, the Technical Support Program will begin to shift in FY 1981 to the pattern of support provided other media program areas, including extending support to enforcement and regional programs.

CHARACTERIZATION AND MEASUREMENT METHODS

1978 Accomplishments

During 1978, resources were $88,400. Of this $1,500 were spent on contracts. The accomplishments included (1) collection and evaluation of technical information needed in initiating a measurement methods development program for toxic substances in air; and (2) development of measurement methods for identification and quantification used in the Love Canal Landfill, Niagara Falls, New York Study.

1979 Program

The 1979 resources for characterization and measurement methods development are $592,200 and 3 positions. The resources include $262,500 for contract work and $140,000 for grants.

The main research objective is to develop improved analytical methods and instrumental techniques for the identification, quantification, and monitoring of toxic chemicals in air, water, soils, and sediments. Emphasis will be given to the development of prototype instruments for the monitoring of toxic chemicals in air; evaluation of improved methods for the measurement of ambient air concentration of toxic chemicals; development of methods for systematically identifying previously unknown toxics in environmental samples. Chemicals to be studied will include priority chemicals as identified by the Office of Toxic Substances and other environmentally significant toxic chemicals. The work will primarily aid the implementation of the Toxic Substances Control Act, as well as the Clean Air Act. Specific research included under this work is described as follows:

- Technical assistance will be provided to the OTS on complex problems related to the development for quantification and identification of toxic chemicals in air, water and soils/sediments.

- Improved analytical instrumentation techniques for identification of the structure of toxic chemicals will be developed. This work will include studies involving spectroscopic techniques and high pressure liquid chromatography-mass spectrometry. These studies will provide information on the structure of complex organic chemicals in air. These methods will be used in measuring exposure concentration of toxic chemicals in air.

- Research will be carried out to develop improved methods for sample collection, separation, and quantification of toxic organic compounds on particulate matter. Rapid, simple, and more sensitive methods are needed to measure the ambient concentration of toxic chemicals around production sources, processing and storage areas, and end use and disposal areas. The output from this research will result in improved mass spectrometry gas chromatography methods for the measurement of airborne toxic organics and will enable the Agency to measure organic chemical concentration in plumes and particulate matter more efficiently and accurately, and will provide better sample collection procedures and separation methods for toxics in air.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$197,800 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$50,000. A net increase of +$10,700 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, -$158,500 was reprogrammed from this activity to scientific assessment within the interdisciplinary media.

1980 Plan

The 1980 resources for characterization and measurement methods development are $637,500 and 3 positions. This is an increase of $15,300 to initiate work on the development of measurement methods for toxics in sediments. Of the total, $285,000 will be devoted to contracts and $151,700 to grants. These resources are assigned to develop improved collection, separation, identification and quantification techniques for toxics in air and to a limited extent in soil/sediment and water.

The characterization and quantification of toxic chemicals in the ambient environment is essential in evaluating hazards and risks to man and the environment. Under TSCA, the number of toxic chemicals to be evaluated runs into several thousands. The Act also requires regulation of new chemicals. For many such chemicals reliable measurement methods must be developed. Unless adequate methods for measurement of toxic chemicals at environmentally significant levels are available, it would be difficult to evaluate to which chemicals and to what levels humans are exposed. Thus, precise risk estimation cannot be made. The improved measurement methods will be used in monitoring programs for measuring exposure levels of toxics in the environment. The exposure data are also needed in the validation of predictive models and in carrying out tests for screening of toxic chemicals. Toxic chemicals investigated will include priority chemicals. Specifically, the work will include the following:

- Technical assistance will be provided to OTS on complex problems associated with the measurement methods development, exposure measurements and identification of toxic substances in air, in soil-sediment and water.

- Work will be carried out to develop improved separation and characterization techniques for toxic chemicals in air. High pressure liquid chromatography, XA-D type resins and extraction methods will be tested in developing separation techniques. The output from this work will enable the Agency to separate toxic chemicals in air samples representing complex mixtures. The availability of good separation techniques is essential in identifying and quantifying toxics in environmental samples.

- Work will be carried out to develop improved and inexpensive devices for collection of toxic chemicals in air. These collection devices will be used in determining exposure levels of toxic chemicals via monitoring methods. The output from this work will assist the OTS in determining the exposure of toxics to man and the environment.

- Methods for characterization and separation of toxic chemicals in the soil/sediment matrix will be developed. Solvent extraction, resins, high pressure liquid chromatography and gas-chromatography mass-spectrometry methods will be used in developing these methods. The output from this work will provide the Agency with the urgently needed methods for analysis of toxic chemicals in the soil-sediment matrix. Our current knowledge of the measurement of toxics in soil-sediments is extremely limited. Soil-sediments are major sinks for many classes of toxic chemicals. The output will also assist in the estimation of multimedia exposure levels of toxics under TSCA.

TECHNICAL SUPPORT

1978 Accomplishments

The 1978 resources were $464,800 and 19 positions, including approximately $20,000 for extramural work. The Technical Support Program for Toxics was initiated in this year. Accomplishments for 1978 include the following:

- Established procedures for "fence-line" monitoring in which documented ambient concentrations of aryl phosphates at the "fence line" of several industrial sites. Data collected contradicted previous reports on the subject.

- Conducted several aerial photographic studies to determine demographic alteration coincident with industrial development.

- Completed trend assessments to determine impact of Endrin label restrictions for areas in Alabama, Lousiana, Mississippi, Oklahoma and Arkansas. Results to date indicate that permitted usage would be greatly reduced if the restriction limits were set at 1/4 of a mile rather than the proposed 1/8 mile.

1979 Program

The 1979 resources for technical support are $1,733,700 and 18 positions, of which approximately $418,400 will be used for contracts and $20,000 for interagency agreements. The resources will be used to carry out the following types of projects:

- Monitor ambient air to identify nature and extent of toxic emissions at 20 industrial sites.

- Conduct multimedia assessments at four or five production sites for two or three classes of chemical compounds to determine if such chemicals are being released to surrounding air, water or soil.

- Supplement aryl phosphate studies to extend documentation from fence line to several kilometers, to better define boundary of possible impact.

- Conduct aerial photographic studies to determine demographic alteration coincident with industrial development at ten industrial sites.

- Initiate expansion of Mass Spectral Search System to begin to include spectra for some 25,000 materials for which spectra are still needed.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$711,300 results from several actions. The Congress applied a $6 million reduction to R&D contracts and monitoring and technical support activities; the decrease applicable to this activity was -$360,000. A net increase of +$59,900 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. In addition, -$411,200 was reprogrammed from this activity to scientific assessment within the interdisciplinary media.

1980 Plan

The 1980 resources for Technical Support are $2,200.500 and 18 positions of which $1,021,000 will be used for extramural projects. This is an increase of $466,800 to support a moderate expansion of efforts to identify and document the nature and extent of toxic burden in the environment, including the adaption of measurement and monitoring techniques to specific toxics. During 1980, the majority of effort of this program will be devoted to assisting the OTS in defining the nature, extent and source of the toxic burden in the environment. The 1980 program will:

- Monitor ambient air emissions of to ics at 40 additional industrial sites.

- Conduct environmental, multimedia assessments on an additional five classes of chemical compounds.

- Conduct photo-interpretive studies at an additional 10 sites to determine demographic alteration coincident with industrial development.

- Add an additional 1,000 spectra (about 4% of those still needed) to the Mass Spectral Search System.

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -	Page
			(dollars in thousands)			
Appropriation						
Health and Ecological Effects	$ 8,213	$12,034	$12,047	$29,397	+$17,350	TS-9
Industrial Processes . .	95	440	452	1,742	+1,290	TS-25
Monitoring and Technical Support	553	3,235	2,326	2,838	+512	TS-27
Total	8,861	15,709	14,825	33,977	+19,152	
Permanent Positions						
Health and Ecological Effects	20	30	32	59	+27	
Industrial Processes . . .	3	8	8	12	+ 4	
Monitoring and Technical Support	19	23	21	21	...	
Total	42	61	61	92	+31	
Full-time Equivalency						
Health and Ecological Effects	...	...	53	93	+40	
Industrial Processes . . .	...	...	8	15	+ 7	
Monitoring and Technical Support	...	...	31	29	- 2	
Total	...	...	92	136	+44	

Purpose

The Toxic Research and Development Program is designed to furnish EPA with sufficient knowledge to: (1) develop first generation testing rules and regulations pertaining to screening techniques for health and ecological effects; (2) provide analyses for transport and fate of ambient pollutants; (3) determine the ambient presence of selected toxic substances; (4) recommend alternative manufacturing process options for the processing and/or production of potentially hazardous or toxic materials; (5) provide a broad spectrum of technical expertise and specialized equipment to agency operating programs.

Most of the FY 1979 research activities to support the Toxic Substances Control Act (TSCA) will continue into FY 1980. The increases in the FY 1980 budget both expand the base programs and provide the resources for the Agency's public health initiative. This initiative provides the first truly integrated focus on assessing human exposure to, and the adverse health effects of, toxic substances as they impinge upon humans through various environmental pathways. The initiative assesses both individual chemical substances in the human environment, and complex mixtures of these substances and their end products.

Research and Development

Health and Ecological Effects

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Health Effects	$ 6,683	$ 8,094	$ 7,540	$15,025	+$ 7,485
Ecological Effects	581	600	1,187	10,402	+ 9,215
Transport and Fate . .	418	2,170	2,150	2,566	+ 416
Stratospheric Modification-Health Effects	297	651	651	781	+ 130
Stratospheric Modification-Ecological Effects	234	519	519	623	+ 104
Total	8,213	12,034	12,047	29,397	+ 17,350
Permanent Positions					
Health Effects	8	12	12	26	+ 14
Ecological Effects	5	9	9	20	+ 11
Transport and Fate	7	9	11	13	+ 2
Stratospheric Modification-Health Effects	-	-	-		--
Stratospheric Modification Ecological Effects	-	-	-		--
Total	20	30	32	59	+27
Full-time Equivalency					
Health Effects	...	...	16	48	+32
Ecological Effects	...	...	11	23	+12
Transport and Fate			22	18	- 4
Stratospheric Modification-Health Effects	...	...	2	3	+ 1
Stratospheric Modification Ecological Effects	...	...	2	1	- 1
Total	...	...	53	93	+40

Budget Request

An appropriation of $29,396,600 and 59 positions is requested for FY 1980. This represents an increase of $17,349,800 and 27 positions over the FY 1979 level.

Of the increase, $15,000,000 and 16 position are for the Agency's public health initiative. The initiative will enable EPA to rapidly expand development of screening techniques and protocols to predict neurotoxicological effects, predictive models for determining extent of human exposure to toxic substances, evaluation methods for determining impact of exposure to toxic chemicals on humans, models for identifying persistence of substances in the environment and movement of toxicants. This initiative provides an integrated approach to assessing human exposure and human health effects of toxic chemicals. The public health initiative is described in more detail under the FY 1980 plan for Health Effects and Ecological Effects.

An increase of $1,699,800 and 8 positions in the health and ecological subactivity will allow increased work on long-term, low-dose research, on a time-to-tumor model, and on development of biological screening indicator methods. This information is needed to provide a better understanding of carcinogenic processes, screening techniques and regulatory testing protocols to predict toxicant effects.

An increase of $416,000 and 3 positions will be used to initiate research on characterization of soils and sediments as well as to develop an environmental forecasting system to predict potential environmental problems associated with toxic substances in multimedia environments. An increase of $234,000 for the Stratospheric Modification program is provided. The requested increase will be applied to expand work on development of precise, accurate, portable instruments for the generation and measurement of ultraviolet rays (UV-B) in order to calibrate field instruments, thereby improving the reliability of studies on the effects of UV-B and improving estimates of the economic costs of future skin cancers related to UV-B increases.

Program description

Specific research to serve the needs of the new Toxic Substances Control Act (TSCA) was first initiated in FY 1978. A limited research program was initiated to provide high priority technical service activities to address the starting needs of the regulatory program. Investigations supporting the immediate requirement to provide criteria for first generation screening techniques and protocols were also started. In FY 1980, the increased resources permit expansion of testing and assessment techniques which will determine the amounts of pollutants moving to humans by means of ecological processes.

The health effects research program has a long term goal of developing new and improved techniques for rapid, reliable and economical screening of toxic substances. These screening techniques will be used by manufacturers to predict the carcinogenic, mutagenic, teratogenic and other deleterious effects on human beings from exposure to chemical substances. The ecological effects research program is also aimed at improving the state-of-the-art for rapid, reliable, and economical screening techniques for predicting adverse effects of the exposure of animal species to toxicants. The transport and fate research program is designed to yield methodologies and data which will provide an understanding of the movement, transformation, and fate of toxic chemicals in air, water, and soils. This information will be used to test toxic substances and to develop exposure assessment models.

HEALTH EFFECTS

1978 Accomplishments

The FY 1978 resources were $6,682,700 and 8 positions. Of this, $722,200 was spent on contracts, $345,000 on grants and $5,131,000 on interagency agreements. Accomplishments under this program include the following:

-- An *in vivo*/*in vitro* teratology study procedure was developed and standardized for use as a short-term screening technique.

-- A procedure for using skeletal variants as an indicator of biological effects of environmental contaminants was developed and evaluated.

-- A report was issued on the effects of acute and chronic cadmium exposure on the known metabolic activity of lindane. In rats, pretesting with cadmium caused inhibition of lindane metabolism, which was of long duration and was not appreciably relieved by chronic exposure to the metal. Thus, in humans, repeated exposure to cadmium may impair the ability of the liver to detoxify other toxic substances.

-- Validation of the Chinese hamster ovary mammalian cell bioassay for mutagenesis, chromosomal aberrations and sister-chromatid exchanges using 14 carcinogen/non-carcinogen pairs was completed. This multi-end point bioassay provides for the simultaneous evaluation of cytotoxicity mutagenicity, and presumptive carcinogenicity (thus saving time and costs) and allows more accurate correlation between primary DNA damage and mutagenic behavior.

-- Ten high priority toxic substances (selected for their ability to induce gene mutation, chromosomal aberrations, primary DNA damage, and oncogenic transformation in procaryotic and eucaryotic systems) were evaluated. The tests performed provided data which may be used for evaluation of large numbers of chemicals regulated under TSCA and demonstrated what test parameters should be recommended to industry.

-- A primary liver culture system was developed and used to evaluate the cytotoxicity of a series of inorganic and organic chemicals.

1979 Program

The 1979 resources for health effects research total $7,539,700 and 12 positions. This includes $449,900 for contracts, $906,000 for grants, and $4,467,400 for interagency agreements.

The health effects research program will continue toward its goal of developing new and improved techniques for rapid, reliable, and economical screening of toxic chemicals. The 1979 program focuses on selecting and validating known techniques for screening so that testing protocols can be developed, and on accelerating the development of promising techniques from the research and development state to practical utility. It includes:

Neurotoxicology and Behavioral Screening/

Neurobehavioral studies and neurotoxicology have not yet been developed and used to a level which will permit their immediate use as screening tests. This area of research, however, is very promising for developing sensitive, early-detection methods for rapid screening of chemical substances. Candidate pollutants will be studied to develop and validate testing methods for behavioral effects that are reliable, economical and applicable on a routine basis.

Human Sterilant Effects/

Human sterilant effects and interference with reproductive efficiency serve as potential indicators of toxic effects. Epidemiological study criteria will be developed which will define the method for documenting reproductive efficiency. Epidemiological studies in industrial communities where exposure is high, and in groups of individuals using chemicals, have proven useful in documenting reproductive failure from exposure to selected pesticides. Previous studies have emphasized male sterility only, but females will also be studied.

Utilization of Time-to-Tumor Model

The time-to-tumor concept involves lab experiments in test animals to determine carcinogenic effects from exposure to toxic substances through correlation with total tumor formulations over time. Current research on utilizing time-to-tumor models will be expanded to examine the feasibility of developing a model that will correlate the total number of tumors generated in a test with the length of time from the initiation of the test to the discovery of the first tumor.

Exposure Measurement of Toxic Substances on Specific Populations

To determine the true amount of a toxic substance which actually reaches the human and creates a harmful effect--the absorbed dose--specific populations must be studied at close range. Correlations between absorbed dose and population effects must then be made to assess the risk from environmental levels of toxic substances. To better derive such data, investigations will be conducted to directly measure exposure for such situations as the following: a person spraying a household product in a room or outdoors; people residing downwind from an emitting source; and a person using laundry products in the home. These activities will be coordinated with other regulatory and

Utilization of Mutagenicity Data

The TSCA explicitly states that EPA should gather data on the mutagenic behavior of certain substances within its purview and utilize this information to estimate the risk of heritable mutations. Since the state-of-the-art for lower animals to man extrapolations is controversial, it can be anticipated that questions will be raised concerning any decision based on experiments such as the Ames test. To validate action in this area, EPA must gain experience in estimating risk based on mutagenicity data. This proposed research will build on past attempts to develop a standardized system which can be used to generate quantitative estimates of risk.

Effects of Toxic Substances on the Immune System

This research effort will develop short-term methods for predicting adverse effects of environmental chemicals on the immune response. A variety of new techniques have been developed to assess the functional capacities of the humoral and cell-mediated systems which can serve as the focus of this effort. It is essential that standard techniques which assess the biological importance of such alterations be developed.

Teratology and the Effects of Toxic Substances on Reproductive Function

Research is currently conducted within the broad area of prenatal toxicology. The research program is active at two levels: the testing of compounds to characterize their potential to induce alterations in the developing organism, and the determination of the significance of toxicity to the fetus expressed in other than anatomical defects. Recent events have made it apparent both that the standard protocols are inadequate as predictors of all postnatal effects induced by prenatal exposure of the mother to toxicants, and that the tests are extremely time consuming considering the number of chemicals to be covered. As a result, research is being conducted to develop criteria for using nonanatomical effects as a measure of impact as well as to improve the capabilities of existing standard testing methods.

Screening Techniques Using Bioindicators

Biochemical assays and metabolic indicators that are predictive of a chemical's ability to induce chronic effects are being developed. As results from exposure are systematized and validated they become an effective screening procedure for prioritizing compounds for more sensitive whole animal toxicological evaluation. Research efforts also focus on several promising areas in the bioindicator field. Investigations to define biochemical thyroid indicators for carcinogenic potential and liver carcinoma are to be initiated. The development of *in vitro* tests to predict *in vivo* chronic effects are expanding. Protocols are being developed for human cell mutagenic and neoplastic transformation bioassays. New bioindicators, including markers for fetal metabolism, are being evaluated for utility in screening systems. Screening with bioindicators for the purpose of early warning is being investigated and will focus on urine and tissue screening for mutagenic metabolites. Regulatory measures based on mutagenicity test results will have to rely to a large extent on confirmatory evidence obtained from a battery of test systems. The Environmental Mutagen Information Center (EMIC) a computerized data base of mutagenicity test results, will be tapped to provide information on substances which are of immediate concern.

Center for Toxicological Research

The Environmental Protection Agency and the Food and Drug Administration jointly fund the National Center for Toxicological Research (CTR) with a mission to conduct research programs designed to increase understanding of the biological mechanisms of potentially toxic chemical substances. In order to obtain the scientific information needed to provide research for making regulatory decisions, research is conducted to determine the health effects of long-term, low-level exposure to chemicals; to develop improved methodologies and protocols to determine the effects of these chemicals; to develop data and techniques to facilitate the extrapolation of toxicological data from laboratory animals to man; and to study the basic biological processes affecting chemical toxicants in animal organisms. This research will enhance the ability of regulatory agencies to deal effectively with a variety of sensitive risk-benefit decisions.

1979 Explanation of Changes from Budget Estimate:

The net decrease of -$554,300 results from several actions. A net increase of +$42,700 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. In addition, -$539,000 was reprogrammed within this activity to ecological effects and -$58,000 was reprogrammed to scientific assessment within the interdisciplinary media.

1980 Plan

The request for FY 1980 is for $15,025,000 and 26 positions of which $6,000,000 and 6 positions support the agency's public health initiative. This is an increase of $7,485,300 and 14 positions over the 1979 level. The total funds include $2,384,800 for contracts, $4,452,100 for research grants, and $5,308,900 for interagency agreements. Our base program includes the following programs:

Analytical Methods for Detection and Identification of Toxic Substances

Development of analytical methodology for broad classes of chemical substances and their metabolites in human and animal body tissues and body fluids is an important aspect of evaluating these substances for harmful human health effects. Scientific techniques and laboratory management processes will be adapted from experience gained with pesticide analytical procedures, and new procedures will also be devised to provide quality control of laboratory tests and to provide good standardized inter-laboratory practices. Support of the toxic substances hazard assessment research will include the isolation, identification, chemical characterization, and confirmation of chemical compounds in environmental samples.

Comparative Toxicology of Aquatic and Mammalian Organisms

Toxicity testing based on mammalian animal studies alone encounters many difficulties when applied to evaluation of large numbers of chemicals. For example, they often require great numbers of expensive animals, testing periods are long, and care of the animal is expensive and labor-intensive. Testing overall is very costly to perform and extrapolation of test results to the human is inexact. Often submammalian species of animals have systems which can be related to similar systems and effects in humans and also can be used to reduce most of the difficulties encountered in the higher life forms. The research goal is to examine the feasibility of using a series of experimental results from studies of cold-blooded species as indicators of the need to initiate testing in mammalian systems. Literature review comparisons will be made of the responses to toxic insults to cold-blooded mammalian species. The information derived from this project could lead to a better integration of the environmental and human health effects systems of tier screening.

Effects of Toxic Substances in Immune Systems

The techniques for detecting immune system competence following toxicant exposure will be further investigated with the development of simple and inexpensive testing procedures and techniques will be developed which measure depression of host immune defense mechanisms which protect humans from disease caused by the presence of bacteria, viruses, fungi, spontaneous tumors and other antigenic foreign materials. Toxic substances will be selected for validating screening techniques which are likely to depress host defense mechanisms. Lymphocyte Bond T blood-cell systems are to be studied for candidate test systems.

Exposure Measurement of Specific Populations of Toxic Substances

Research will continue relate to more closely absorbed dose of a toxic substance to the elicited effect in the human organ or life system. Association of the presence of chemicals in the environment with human disease using methods currently available to epidemiologists is at best indirect. Quantitative estimations of exposure are rare and it is generally necessary to rely on occupational histories in particular industries. Disease processes correlated with occupational exposure in such industries can rarely be attributed to single agents. Methods for analytically determining the exposure history to chemicals in general would greatly increase the confidence that could be placed in

Epidemiology of Susceptible Human Populations

Development of methods for screening toxic substances requires that the technique be validated for its applicability to prediction of human health. In order to assess the relationship of methodology to human effects, epidemiological studies of the reaction of human populations to environmental toxic chemicals must be performed. The FY 1980 program will apply epidemiological research, including supporting exposure assessments, to determine susceptible human populations and the acute and chronic health effects found in such populations identified with occupational and community exposures to suspected substances.

Human Reproductive and Sterilant Effects

Research will determine the relationship of toxic substances to reproduction and sterility. Such areas may yield screening techniques, such as a community fertility index. Additionally, new and improved procedures, including isozyme studies and postnatal metabolic and toxicologic assessment, will be evaluated as indicators of the effects of toxic substances to reproductive function teratology.

Increases in the base program of $1,540,000 and six positions will be used as follows:

Utilization of Time-to-Tumor Model

Research will apply this technique to reducing time required for obtaining carcinogenicity test results.

Screening Techniques Using Bioindicators

This promising area for producing many rapid, reliable and low-cost screening procedures will be expanded to assist the development of tier battery of screening tests.

Center for Toxicological Research

Research particularly for long-term biological assessment will continue for substances of importance to the Federal regulatory agencies. The research will expand the FY 1979 program slightly to: determine the health effects of long-term, low-level exposure to chemicals; develop improved methodologies and protocols to determine the effects of these chemicals; develop data and techniques to facilitate the extrapolation of toxicological data from laboratory animals to man; and study the basic biological processes affecting chemical toxicants in animal organisms.

Public Health Initiative

This research includes an increase of $6,000,000 and six positions to support the Agency's public health initiative by providing an integrated approach to assessing the significance of human exposure and adverse human health effects from chemicals and chemical mixtures which have been or might be released into the environment.

The initiative recognizes the need for pharmacokinetic modelling, which enables prediction of the significance of human exposure to a toxic substance; taking into consideration the influences of other chemicals, the mode of entry into the body, the actions of various immunologic, hormonal, and enzymatic systems the rate of excretion of substances and the effect on body organs or systems. The public health initiative further recognizes the need to provide evaluation of both the predictive models and the effectiveness of preventative measures such as regulations and controls to decrease an adverse health impact. Furthermore, special attention is given to the refinement and verification of short-term neurological and behavioral tests for evaluating the toxicity of chemical substances. Implicit within these three areas will be requirements for improving existing and developing new methods for physiological and biochemical measurements. The fulfillment of these needs will permit greater precision in the selection of adverse substances and complex mixtures to be subject to more extensive testing.

Research on human exposure will be approached from two aspects. One approach, the predictive, projects before a chemical substance has been permitted to enter the environment how a substance will be handled by the body, what target organ would be affected and what the significance of a potential effect would be. The second approach, the evaluative assesses human exposure to chemical substances by actual measurement of the entry, transport and fate of substance within the body after the chemical has been released into the environment. The first objective of this portion of the initiative is to provide data usable to establish the feasibility of developing predictive toxicity models and toxicity indicators which are discriminating, relatively simple to utilize, and inexpensive to analyze. The second objective is to provide methodology which accurately and inexpensively monitors and verifies the performance of the predictive models and the effectiveness of any controls imposed upon the release of a substance into the environment.

Predictive approaches basically rely on the development of models, or analytical schemes, which assess exposure by estimates of the degree of absorption, of metabolic change, and of distribution of chemicals in the human body modified by the rate of excretion and removal from the tissues. In developing and applying these predictive pharmacokinetic models existing knowledge of biochemical, physiological and immunological systems will be employed. Data derived from our own research as well as that developed by the interspecies relationship project will provide coefficient for the models. Such models should also establish relationships between concentration of substances in tissues such as hair, nails and saliva, and the ambient levels to which a person was exposed.

Evaluative methods will be developed to assess exposure to chemical substances which depend upon specific intermediate metabolities of chemical substances binding to protein (adducts) in a manner which permits ready identification. The protein in red blood cells, hemoglobin, has been observed to engage in this binding activity, and because of its easy accessibility, hemoglobin is the tissue of choice for these studies. A person's own blood then becomes an integrating dosimeter for quantifying exposure to specific chemicals. Methods which utilize living organisms to quantify the levels of toxic chemicals in the environment will also be developed. These can replace costly and sophisticated chemical analyzes in many instances.

Especially in the area of neurotoxicology, major deficiencies exist in the availability of rapid, reliable, and economical testing methods which are to be used by manufacturers, as required by TSCA. The public health initiative will complete the establishment of a National Neurotoxicological Research Facility to serve, particularly, the Federal Agencies forming the Interagency Regulatory Liaison Group (IRLG). This center will carry out a comprehensive, cooperative program to determine means of detecting the often subtle effects of toxic substances on the nervous system and to evaluate the significance of these effects to humans. Determining these effects can lead to highly sensitive screening and long-term research techniques. Research activities planned include: development and validation of new short-term tests and currently existing methods to enhance stability, sensitivity, and cost effectiveness; performance of toxicity testing using existing methodologies to establish preliminary guidelines for methods to be used in toxicity testing of chemicals; conducting research to determine mechanisms by which agents produce neurotoxic effects; and assessment of the effects of toxic substances on the central nervous system (CNS) and developing methodologies to assess specific CNS indicators of toxicity.

ECOLOGICAL EFFECTS

1978 Accomplishments

The 1978 resources for ecological research on toxic substances amounted to $580,700 and 5 positions. Of this amount $56,000 was expended for grants and $262,800 for contracts. Overall emphasis was on development and validation of rapid, reliable screening procedures. Accomplishments of note on development of these screening procedures include:

- Conduct of round-robin tests to develop protocols for acute bioassays between four in-house laboratories and four contractors using fish, shrimp, copepods and aquatic algae as the test organism. These tests are critical in developing reliability of the measurements as all laboratories must be able to do the same test the same way and obtain the same results. As a result of using intact organisms and due to other causes, accuracy is often lacking from similar tests run in different laboratories.

- Evaluation of rapid methods of determining in vitro fish enzyme sensitivity to various chemicals. This may permit quicker, more accurate tests than using an intact whole organism.

- Determination of early development stages of fathead minnow suitable for use in embyro/larvae fish toxicity tests. Selection of the most sensitive stage(s) contributes to accuracy of the screening method.

- Evaluation of a new and potentially very accurate fish embryo/larvae toxicity test system for complex effluents.

- Validation testing of a special assay procedure using benthic polychaetes. This is the only benthic test the Office of Toxic Substances is using in assay methods for marine environments. In view of the importance of ocean dumping and outfalls, the validation of this test for use is important.

FY 1979 Program

The 1979 resources are $1,187,000 and nine positions. Approximately $518,000 will be spent on contracts and $204,000 on grants. Ecological effects research emphasizes the development of rapid, reliable procedures for screening chemical substances and mixtures, and develops the scientific protocols for these screening techniques. There will be continued effort to refine, validate, and calibrate ecological screening procedures which provide the scientific basis for making initial decisions concerning the safety and acceptability of a chemical or chemical mixtures in the environment. A variety of tests for marine, freshwater, and terrestrial organisms and communities are being examined as are biological processes and effects of various pollutant concentration levels for both plants and animals.

Although new screening techniques are under development, emphasis is on validation and calibration of existing procedures and modifications of existing procedures. The validation and calibration work is essential to the immediate regulatory needs. The research program is developed in cooperation with the Office of Toxic Substances to meet their defined needs. In addition, screening tests developed under this research program are examined and modified, where appropriate, for use in other program areas, such as the ocean dumping permit program and the registration and reregistration of pesticides.

1979 Explanation of Changes from Budget Estimates

The net increase of +$587,000 results from several actions. A net increase of +$48,000 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its 1979 operating plan +$539,000 was reprogrammed within this activity from health effects.

1980 Plan

In 1980 $10,402,000 and 20 positions are being requested for ecological effects research ($1,402,000 and 10 positions for base programs and expansion thereof and; $9,000,000 and 10 positions to support the public health initiative). This includes $7,223,000 in grants and contracts.

The proposed FY 1980 base plan calls for increased effort of $215,000 and one position to refine, validate, and calibrate ecological screening procedures for the Office of Toxic Substances. This validation and calibration work will continue to use in-house and contract laboratories. Round-robin methods testing for acute bioassay work will continue with emphasis shifting to testing of bioconcentration methods. The expected output of this effort is a number of approved ecological screening procedures, covering both plants and animals.

An increase of $9,000,000 and 10 positions is provided for research to support the public health initiative which is briefly described below:

Human Exposure to Environmental Toxics

The Agency faces many very complex and difficult scientific questions regarding the regulation of potentially toxic substances. The capability to predict human exposure to environmental toxic chemicals is seriously limited at this time. Further, until now, the scientific effort to overcome these limitations has been wanting in resources and in direction.

In FY 1980, a major effort will be undertaken to expand the knowledge about how exposures occur and to develop methods which will allow us better to predict exposures and to determine those that occur now and may have happened in the past. The program will continue from three to five years and will be centrally directed. The research will be focused on specific objectives designed to provide timely and relevant outputs that will eliminate some of the major deficiencies in our current exposure assessment capability. Research will proceed along three routes of inquiry as follows:

Predictive Knowledge and Methods

The FY 1980 program in this area will accelerate the progress of the development, validation, and verification of several promising exposure models, including field testing of available modelling approaches and an evaluation of the potential of such short and qualitative approaches as "benchmark" and "structure-activity" models. Research will be expanded considerably to define and characterize those environmental processes and pathways that significantly influence, both within a single medium and across media, the transport and transformation of substances which result in human exposure. Of particular importance are the biological and biochemical transformation occurring in the human food chain. Also, the program includes a major effort to evaluate the utility of selected laboratory ecosystems (or "microcosms") as consistent and reliable mechanisms for possible use as screening devices, validation tools for models, and predictive devices. If this evaluation is favorable, further development and validation of these systems will be accelerated considerably. Finally, several specific problems relating to human exposure will be addressed. For example, for the first time, it is planned to evaluate the role of the terrestrial/soils/sediment pathway as a sink and source of human exposure to environmental toxic substances.

Evaluative Methods and Integration

One of the major gaps in the knowledge concerns the range of actual exposures to a toxic substance that occurs in a population owing to the variability in human behavior. In many cases, general levels of the substance in various compartments of the environment can be measured or predicted. However, the populations vary widely in their mobility, activity, place of residence and work, food consumption patterns, etc.

A two-pronged research program will address this problem. First, field surveys and monitoring studies will be carried out to determine representative frequency distribution for exposures that are likely to occur under various types of exposure. Part of this program will require the development of specialized personal monitors to record actual individual exposures. Among other purposes, this program will provide the first major "ground truth" data by which to validate and/or calibrate exposure prediction models.

The second portion of this effort will be to integrate and to design improvements in the operation and use of existing data bases on human exposure. A relatively large number of data bases exists at the Federal and State level. They are not consistent in the type of data format, nor do they include relatively accessible data critical for exposure estimation. The objective is to remove inconsistencies and expand the system where appropriate to provide an integrated source of human exposure data.

Measurement Methods

Progress in both the predictive and evaluative components of the human exposure research program will require advances in measurement methods. (Currently, the capability to identify and measure toxics in human pathways economically and efficiently is severely lacking). Included in this research initiative are projects to meet the most critical requirements. Particularly, procedures will be improved for collecting and preserving samples of soils, sediments and plants. Similarly, standardized procedures will be developed for sample preparation, i.e., extraction of the toxic substances from different soil or tissue matrices without alteration. Finally, standard reference materials will be developed for those substances which are the focus of coordinated studies.

STRATOSPHERIC MODIFICATION - HEALTH EFFECTS

1978 Accomplishments

Resources in 1978 amounted to $297,500 and 0 positions. This included $159,900 for grants and $23,800 for contracts.

Major program accomplishments include:

- Completion of three epidemiological studies to establish a quantitative relationship between the incidence of skin cancer and UV-B dose. A statistically significant correlation showing higher incidence of non-melanoma skin cancer at southern latitudes with higher UV-B flux was established, but a wide range of uncertainty remained concerning the incidence of melanoma and the actual dose received by subjects surveyed for both types of skin cancer.

- Completion of studies that found qualitative increases of 10% to 40% in non-melanoma skin cancer with a 10% increase in UV-B. Non-melanoma incidence is increasing generally. Artificially generated UV-B was shown to induce non-melanoma skin cancer in mice, and solar UV-B produced the same effects in rats. The immuno-defense system of mice was shown to be suppressed by artificially generated UV-B.

- Initiation of work to develop a prototype personal dosimeter that measures the actual dose received by individuals and correlates with Robertson-Berger measurements of UV-B at the earth's surface.

- Development of alternate models to make an integrated assessment of causes, effects and controls of ozone depletion and evaluation of their continuing utility to supply information for making regulatory decisions. Specific outputs will include (a) comparison of the effectiveness of international versus national controls, (b) evaluation of the effectiveness of non-market versus market control instruments, (c) evaluations of the cost of delayed skin cancer to future generations, and (d) identification of research priorities.

- Submission to Congress in January, 1978, of state-of-the-art report on causes and effects of stratospheric ozone depletion, and initiation of work on the full National Academy of Sciences (NAS) contract required under PL 95-95.

- Establishment of the Interagency Committee on Stratospheric Ozone Protection (ICSOP) which is coordinating Federal research on ozone protection.

1979 Program

The 1979 resources are $651,000 and 0 positions. Approximately $299,000 will be spent for interagency agreements, $157,000 for contracts, and $98,000 for grants.

The research program will conduct epidemiological studies on the correlation of melanoma and non-melanoma skin cancer, UV-B and life styles. A limited number of personnal dosimeters will be produced and used in a pilot application. Work on a model to forecast anticipated increases in non-melanoma and melanoma skin cancer from increased UV-B will be initiated.

Computer modelling will be initiated to examine the hypothesized relationship between increased UV-B and increased photochemical smog.

Data for use in making integrated assessments of causes, effects, and controls of ozone depletion will be updated, with special attention to sensitivity of results to health data variations. A report on alternate economic measures of health costs to future generations will be completed.

The NAS state-of-the-art report on causes, effects, and alternate controls of stratospheric ozone protection will be completed. To further provide information for regulatory decision making ICSOP meetings will be held, Federal research on ozone depletion coordinated, research priorities identified, and anticipated health effects research by the National Cancer Institute indicated. Material for a second biennial report to Congress will be prepared.

1979 Explanation of Changes from Budget Estimates

There is no change from the budget estimate.

1980 Plan

In 1980 funds of $781,000 and 0 positions are requested for Stratospheric Impact Research and Assessment. This is an increase of $130,000 which will be used to reduce the uncertainties regarding the health effects of ozone depletion. Approximately $50,000 will be spent for interagency agreements, $155,000 for contracts, and $350,000 for grants. This program is an integral part of the Health Effects program and obtains some minimal manpower assistance from it.

The program is focused on improving knowledge of the relationship of UV-B to both melanoma and non-melanoma skin cancers; attempting to determine if UV-B increases may affect human health by augmenting the generation of photochemical smog; improving measures of the economic and social costs of skin cancers; and continuing to provide updated state-of-the-art knowledge, integrated assessments of causes, effects and control of stratospheric ozone depletion.

To enhance understanding of UV-B and skin cancer relationships personal dosimeters will be applied; UV-B flux at epidemiological survey sites will be measured; UV-B data will be correlated with cloudiness, turbidity, and ozone levels; and a forecasting model for projecting skin cancer incidence and relationship with UV-B enhancement will be developed.

Initial model calculations on UV-B and photochemical smog will be reported, and smog chamber studies initiated.

Sensitivity analyses of health damages will continue, economic and social measures of skin cancer costs will be tested, and these and other data will be combined to make integrated assessments of causes, effects, and alternate controls of ozone depletion. Federal research will be coordinated by ICSOP, and data used for assessments. To strengthen such assessments and to provide additional information for biennial reports to the Congress, design of a model and data specifications to identify future potential causes, effects and control of ozone depletion will be completed.

STRATOSPHERIC MODIFICATION - ECOLOGICAL EFFECTS

1978 Accomplishments

FY 1978 resources amounted to $233,700, including $56,000 for grants and $100,000 for contracts.

Major program accomplishments include:

- Correlation of Robertson-Berger meter measurements of global UV-B irradiance with Dobson ozone measurements indicated approximately 20% change in global UV-B flux for every 10% ozone fluctuation. Work has been initiated to develop and deploy two automated spectrophotometers to perform UV-B and ozone measurements simultaneously to reduce the uncertainty of this correlation.

- A workshop on Regional Climate and Stratosphere Change contributed to improved state-of-knowledge regarding possible effects of continued emissions of chlorofluorocarbons (CFCs) on surface temperatures. Current indications are that a slight cooling, possible local perturbation of wind and storm tracks, and atmospheric waves may accompany a 10% ozone depletion.

- Experiments identified UV-B dose-response relationships for mortality, brain and eye lesion incidence, and retardation of growth/development of the larval stage for northern anchovy and Pacific mackerel; that DNA is the most likely "target" molecule for such effects; and that UV-B may be detrimental to other near-surface zooplankton species. Also, it was established that for anchovy larvae doubling the cumulative dose which induced 50% mortality in 12 days would induce the same mortality in four days; predicted that there would be 50% mortality at 4 meter depth in clear ocean water and at 0.8 meter in turbid waters; and that 19% reduction in ozone thickness would retard growth and development and produce significant incidence of eye and brain lesions after four days exposure in clear water. Preliminary findings that natural UV-B levels affect surface and near surface primary productivity were confirmed. Techniques to calculate UV-B flux at various depths in any ocean water in the presence of chlorophyll-containing organisms were developed.

- Plant experiments showed that exposure to UV-B decreased epidermal transmittance but had no effect on the plant growth hormone abscissic acid.

- Estimates of the effects of climate changes potentially caused by CFM increases, CO_2 increases, or increased nitrous oxides releases, using an econometric model, indicate small effects of each of these causes treated separately, on U.S. wheat and corn production, but large effects where combined. Effects on the rest of the world are more severe, and CO_2 is estimated to have the largest effect. Since effects are sensitive to both technical (e.g. CFM release and concentrations) and economic (e.g. changes in values of crop in response to pollutant impact on climate) parameters, current results are speculative, but can be improved with research. A bioeconomic model of the impact of ozone depletion on fisheries (assuming fishery regulation) shows wide variance with previous estimates.

1979 Program

The FY 1979 program is funded for $519,000. Approximately $75,000 will be spent for grants, $85,000 for contracts, and $270,000 for interagency agreements.

Controlled field experiments on crop yield and photorepair effects for sensitive crops under varying UV-B levels will be initiated. Laboratory experiments to examine effects of UV-B on photosynthesis will be undertaken.

UV-B marine and freshwater penetration studies will be expanded, the specific goal being to attempt to determine the effects of increased UV-B penetration on plankton organisms. Studies of UV-B effects on northern anchovy and Pacific mackerel, as well as shrimp and crab larvae in natural waters will be conducted. Attempts to more closely identify molecular targets of UV-B will be made as a basis for predicting effects on marine and other organisms.

Priorities for further research in biological effects will be identified and these effects/priorities will be incorporated into both the January 1980 report to Congress and integrated assessment models of costs and benefits of controlling ozone depletion. The NAS study will contain a "state-of-the-art" report on biological effects of stratospheric modification.

1979 Explanation of Changes from Budget Estimate

There is no change from the budget estimate.

1980 Plan

In 1980, $623,000 and 0 positions are requested for research on ecological effects of stratospheric modification. This is an increase of $104,000 which will be used to improve understanding of the ecological and climatic effects of ozone depletion. Approximately $130,000 will be spent on grants, $185,000 on contracts, and $170,000 on interagency agreements. This program is an integral part of the Health Effects program and obtains some minimal manpower assistance from it.

Studies of field crop sensitivity and effects of UV-B on photosynthesis will continue, with interim reports as advances in the state-of-the-knowledge occur. Ongoing studies of effects of increased UV-B on plankton organisms will be completed, and an evaluation of results and possible value for estimating effects on other marine organisms will be reported. Final results of studies of UV-B effects on shrimp and crab larvae and on northern and Pacific mackerel will be available. The study of critical molecular targets of UV-B, and the ability to predict effects on a range of marine organisms from the results will also be completed.

All new ecological and biological effects data will be used in updating integrated assessments of causes, effects, and possible controls of stratospheric ozone depletion. Further research needs on ecological effects will be presented to the Interagency committee on Stratospheric Ozone Protection (ICSOP) for transmission to Federal Agencies identified in the Clean Air Act of 1977 (PL 95-95) as responsible for continuing research on ecological effects of stratospheric ozone depletion.

TRANSPORT AND FATE

1978 Accomplishments

In 1978, resources were $418,100 and 7 positions extramural expenditures were as follows: $58,400 for contracts, $139,900 for grants, and $5,000 for interagency agreements.

The program:

- Developed (in coordination with anticipatory research) prototype environmental exposure analysis models and laboratory procedures for predicting the pathways of potentially harmful chemicals in freshwater environments, and applied the procedures to nine chemicals.

- Established (in coordination with anticipatory research) that the relationship between the sediment/soil sorption coefficient and the octanolwater partition coefficient for a wide range of hydrophobic compounds of varying solubilities is reliable for most sediments and soils.

- Established (in coordination with anticipatory research) that rate constants for microbial hydrolytic transformation of toxic substances in waters representative of most of the United States are constant and reproduced from site to site.

- Developed concepts and prepared an R&D plan for creating a tested computerized data analysis system for calculating concentrations of toxic chemicals in various portions of aquatic environments under a variety of conditions, using data acquired under the Toxic Substances Control Act.

- Assessed the state-of-the-art of multimedia modelling for toxic chemical exposure assessment.

- Co-sponsored a symposium on the use of microcosms in ecological research.

- Produced a status report on the potential problem of ozone depletion in the stratosphere resulting from the release of freons and other halogenated hydrocarbons.

- Identified numerous toxic organic compounds being released from the Love Canal Landfill, Niagara Falls, New York.

1979 Program

In the transport and fate area, 11 positions and $2,150,100 were allocated for FY 1979. These resources are assigned to the study of transport, fate and exposure of toxic chemicals in air, water and soil-sediment environments. The extramural funding includes $530,000 for contracts and $870,400 for grants.

The main research objective is to obtain information and to develop a better understanding of the transport, transformation, fate and persistence of toxic substances in air, water, and soils. The research work will involve the characterization of environmental processes, measurement of rate parameters, determination of persistence of chemicals and identification and quantification of degradation products of toxic chemicals. This information will be integrated into the development of an exposure assessment technology to be used in predicting transport and transformation of toxic chemicals in the environment. Work on environmental simulation and microcosms will also be carried out in order to validate the models representing real environments. It is anticipated that the above work will also lead to the development of testing protocols to be used by the Office of Toxic Substances (OTS). Toxic substances to be investigated will include priority chemicals as identified by OTS as well as other environmentally important toxic chemicals.

Specific research will include the following:

- Technical assistance to the OTS in the development of protocols and regulations, and provision of expert witness, scientific review and consultation.

- Development and validation of exposure models for toxics.

- Detailed multimedia exposure analysis and assessment methods development applied to selected toxic chemicals in various media and in the food chain. The output from this work will aid the risk assessment of toxic chemicals to man and/or the environment.

- Acceleration of research on the characterization of environmental transport and transformation processes such as photolysis, adsorption/desorption, volatilization and microbial degradation as applied to toxic chemicals. Emphasis will be placed in defining the role of sorption, temperature, and organic humci matter on the environmental processes. The output from this work will provide information about the rate parameters and mechanisms of the environmental processes, as applied to toxic chemicals.

- Research efforts toward the development of modelling capabilities for toxic chemicals will be intensified. Various inputs will be used in building models and will include the models based upon physical-chemical properties and environmental rate parameters, structure activity, simulation of environmental systems for validation and a use of microcosm technology, aquatic ecosystems (AEcoS), filled channels and model systems. Once models, environmental parameters, microcosms and simulation

techniques are fully developed and validated, they will be transformed into suitable protocols for testing of toxic chemicals. The output from this work will include papers or reports describing various modelling techniques for the prediction of fate and transport of toxic chemicals, microcosm technology, use of AEcoS, exposure assessment technology and structure activity relationship applied to toxic substances.

- The transport, transformation and persistence characteristics of toxic chemicals in air will be determined. Emphasis will be placed on measuring the concentration, persistence, identification and quantification of toxic chemicals in selected U.S. urban atmospheres and along roadways. The output from this research will provide needed information on the exposure of toxic chemicals and their degradation products in the ambient air, and will be used in exposure model development. The fate and transport of selected toxic chemicals in relation to their effects on ozone layers will also be studied. The output from this research will provide a better understanding of the effect of toxic chemicals on the stratospheric ozone layer.

- Study of the vapor phase photolysis of selected toxic chemicals will be carried out. This work will focus on defining the role of photodegradation and hydroxyradical reactivity in testing of toxic chemicals. The output from this work will include the development of air transport models for exposure assessment of toxics in air, photodegradation protocol for toxics in air, and information on vapor phase photolysis.

- Study of the leaching of toxic chemicals in soils will be initiated on selected chemicals. Emphasis will be given to defining the leaching potential of chemicals in relation to chemical structure and soil characteristics. The output from the work will assist in the development of models for predicting leaching, diffusion and exposure of chemicals in soils. This work will aid in providing a better leaching protocol to be used in testing of toxic chemicals.

1979 Explanation of Changes from Budget Estimates

The net decrease of -$19,900 results from several actions. A net increase of +$39,100 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. In addition, -$59,000 was reprogrammed from this activity to scientific assessment within the interdisciplinary medium.

1980 Plan

In the transport and fate of toxic substances area, 13 positions and $2,565,600 were allocated for 1980. This is an increase of $415,500 and two positions which will be used to initiate research on characterization of soils and sediments for toxic substances as well as to develop an environmental forecasting system to predict potential environmental problems associated with toxic substances in multimedia environments. The extramural funding includes $636,300 for contracts and $1,046,800 in grants. These resources are assigned to develop exposure assessment methodologies and testing protocols for toxic chemicals in air, water, soils and sediments. To develop the exposure assessment methodology, a precise knowledge of the transport and transformation of toxic substances is needed. Therefore, effort will be intensified to carry out transport and transformation studies on toxic substances.

The main research objective is to carry out research for the development of exposure assessment models for toxic chemicals in multimedia environments and to develop improved protocols for testing of toxic chemicals. The research will involve the characterization of environmental processes, measurement of rate parameters, developing quantitative expressions for environmental process description, determination of persistence of chemicals and identification and quantification of degradation products of toxic chemicals. The environmental process work will be validated in laboratory model ecosystems. The information obtained from the environmental processes work will be used in the development of exposure assessment techniques to be used in the evaluation of the risk which toxic chemicals may produce on humans or the environment under TSCA. It is anticipated that the above work will also lead to the development of improved testing protocols to be used by the OTS in screening of toxic chemicals. Toxic substances to be studied will include priority chemicals identified by OTS and other environmentally significant chemicals. Specific research will include the following:

- Technical assistance will be provided to OTS in the development of testing protocols, exposure assessment and regulations and provision of expert witnesses, scientific review and consultation.

- Exposure models for toxic chemicals in air, water, soils and sediments will be developed as well as the single models for multimedia exposure models. Such factors as mass-balance and intermedia transfer coefficients will be considered in the model development. Attempts will be made to validate these models using available data in the literature and model ecosystem (microcosms). These models will be used to carry out exposure analysis on selected toxic chemicals. The output from this work will be used to estimate the exposure and risk toxic chemicals may produce on humans and the environment, as required by TSCA.

- Work will be carried out to examine the reactivity of toxic chemicals in air. This will include investigation on the identification and reactions of organic toxic chemicals in air, and photolysis of toxic chemicals. Photolysis products will be identified. The output from this work will be helpful in developing the exposure models and testing protocols for toxic chemicals. These protocols are needed in the implementation of Section (4) and Section (5) of TSCA.

- Studies will be carried out toward characterizing the photolytic process for toxic chemicals on soils, sediments and plant surfaces. These studies will be aimed to develop testing protocols to be used in the implementation of TSCA.

- The microbial degradation process (anerobic and aerobic) of toxic chemicals will be investigated. Special emphasis will be given on developing quantitative methods for estimating rate constants and persistent characteristics of toxic chemicals. The output from this work will be used in developing exposure models and testing protocols.

- Work on smog chamber and model-ecosystems will be continued toward improving and standardizing the system. The system will be tested for reproducibility. The output from this work will assist in the validation of laboratory data and exposure models.

- Work on leaching of toxic chemicals in soil and sediment matrices will be expanded on other toxic chemicals. (Attempts will be made to develop mathematical models and testing protocols for predicting leaching of toxic chemicals).

- Soils and sediments from various locations of the U.S. will be characterized in terms of organic contact, clay content, exchange capacity, etc. The soils and sediments will be tested for adsorption-desorption, degradation and leaching of toxic chemicals. The soils and sediments will be classified and evaluation will be made as to the feasibility of using selected number of soils and sediments for testing of toxics, so that results could be extrapolated to any geographical location in the U.S. The output from this work will aid in improving the testing of toxics in soils and sediments and will reduce cost associated with testing under TSCA.

- Improve methods for Octanol/water partition coefficients will be developed. Effect of temperature and concentration will be studied. The reproducibility, precision and accuracy of the method will be evaluated. The output from this work will assist in predicting the exposure of toxics in biota and sediments. The output will also result in an improved protocol for partition coefficient determination.

- Work will be initiated to select representative chemicals to serve as benchmarks from various classes of toxic chemicals. Physical-chemical properties and environmental transport and transformation parameters of the benchmark chemicals will be determined. These data, in conjunction with use, production, disposal and toxicity information, will be integrated to develop benchmark environmental profiles. These benchmark profiles will be used in screening of new toxic chemicals under TSCA. The output from this work will serve as an environmental forecasting system for predicting potential environmental problems with toxic substances.

Research and Development

Industrial Processes

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Industrial Processes . .	95	$440	$452	$1742	+$1290
Permanent Positions					
Industrial Processes . . .	3	8	8	12	+ 4
Full-time Equivalency					
Industrial Processes . . .	...	...	8	15	+ 7

Budget Request

In FY 1980, a request for this program is $1,742,000 and 12 positions an increase of $1,289,600 and four positions to provide funding for (a) assessments of alternative processing routes and in-process modifications required to minimize production of toxic contaminants in chemical feedstocks, intermediates, and products, and (b) development of a "new" chemical manufacture predictive model based on the unit process approach.

Program Description

A research program is being conducted to support directly the current needs of the Office of Toxic Substances (OTS). Major objectives of the program include: (1) provision of technical assistance relating to toxic identification and quantification for industrial processes and products; (2) evaluation of process alternatives in terms of environmental acceptability based on toxic pollutant criteria; (3) definition of the occurrence of toxic substances as impurities in commercially available chemicals from a knowledge of process chemistry and waste composition; (4) provision of technical assistance in terms of participation in working groups, review of reports, documents, and development of expert testimony as required by OTS; (5) provision of perspectives on the occurrence and use of high priority TSCA chemicals for industrial processes; (6) provision of information on the availability of substitute chemicals to replace chemicals for which TSCA mandates decreased consumption, including information on the economics of substitution; and (7) provision of in-plant manufacturing process quality control assessments.

1978 Accomplishments

The FY 1978 resource level for this program activity was $94,700 and three positions. Resources were expended for personnel costs only. Specific accomplishments include the following projects:

- Available data bases were reviewed for the following types of information: (1) data on the use occurrence of high priority TSCA chemicals in industrial processes; (2) information on the availability of substitute chemicals as replacements for those chemicals that are suspect including information on the economics of substitution; (3) information on the production and use by industry of selected toxic chemicals, including toxic contaminants or impurities in selected feedstocks, intermediates and products.

- An assessment of the manufacturing process for nitrobenzene/aniline was conducted to evaluate alternative processes as options for the chemical production. The current process was suspect because of the potential for the presence of nitrosamines, and

Abatement and Control

TOXIC SUBSTANCES

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
	(dollars in thousands)					
Appropriation						
Toxic Substances Strategies.....	$11,582	$41,598	$40,970	$65,543	+$24,573	TS-32
Permanent Positions						
Toxic Substances Strategies.....	199	428	425	553	+128	
Full-time Equivalency..	...	...	412	549	+137	

Purpose

The abatement and control appropriation encompasses activities relating to implementation of the Toxic Substances Control Act's (TSCA) policy that (1) adequate data should be developed with respect to the effect of chemicals on health and the environment and that the development of such data should be the responsibility of those who manufacuture and process the chemicals, and (2) adequate authority should exist to regulate chemicals which present an unreasonsable risk of injury to health or the environment. Toxic substances abatement and control covers the following subactivity:

Toxic Substances Strategies - This subactivity includes the information related activities of developing test standards and applying them to specific chemicals by rule to obtain test data from industry, establishing reporting and recordkeeping requirements to obtain existing information on chemical substances, setting requirements for submission of information by industry on new chemicals and significant new uses, monitoring for field data, implementing and operating data management systems, and exchanging nonconfidential information with other programs, Federal agencies, States, public interest groups and the general public. It also includes scientific assessments of effects, exposures, and risks for new and existing chemicals based upon this information and technical determinations of control options, including economic considerations. Control related activities include taking formal actions on the manufacturing, processing, distribution, use, and disposal of new and existing chemicals under TSCA authorities, referring action to other programs or agencies, and taking nonregulatory approaches.

Toxic Substances

Abatement and Control

Toxic Substances Strategies

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Testing and Evaluation..	$5,239	$17,501	$17,196	$36,645	+$19,449
Chemical Control.....	1,225	7,987	7,800	12,131	+4,331
Information Integration.	4,361	14,876	14,741	15,547	+806
Toxics Management.....	757	1,234	1,233	1,220	-13
Total.....	11,582	41,598	40,970	65,543	+24,573
Permanent Positions					
Testing and Evaluation..	74	171	171	243	+72
Chemical Control.....	33	117	117	164	+47
Information Integration.	69	94	94	103	+9
Toxics Management.....	23	46	43	43	...
Total.....	199	428	425	553	+128
Full-time Equivalency					
Testing and Evaluation..	...	...	154	223	+69
Chemical Control.....	...	...	98	149	+51
Information Integration.	...	...	111	130	+19
Toxics Management.....	...	...	49	47	-2
Total.....	...	...	412	549	+137

Budget Request

An appropriation of $65,542,800 and 553 positions is requested for 1980. This is an increase of $24,573,000 and 128 positions over the 1979 level, reflecting implementation of a more fully operational TSCA program. These resources will permit expanded development of testing requirements and conduct of assessments to provide an adequate information base for present and future actions under TSCA and other toxics related programs. The program for review of and action on new chemical notifications will become fully operational. Control actions will be taken on selected chemicals identified as posing unreasonable risks. Required information gathering and management, monitoring and economics support for these activities will be provided.

Program Description

The toxic substances strategies subactivity is comprised of the testing and evaluation, chemical control, information integration, and toxics management elements. These elements cover the Agency's testing, assessment, new chemical review, existing chemical control, economics, recordkeeping and reporting, data management, monitoring, toxic substances coordination, and industry assistance responsibilities under the Toxic Substances Control Act.

Testing and Evaluation - The goals and objectives of the TSCA testing and evaluation program aim to increase efficiency and scientific credibility of toxic substances program assessments and regulations. They are: (1) to develop a cost-effective testing scheme for determining experimentally the health and environmental effects of chemicals; related to this goal is the annual review of all test standards for revision as necessary to maintain an up-to-date and comprehensive scheme; (2) to obtain test data where required for making evaluations of risk and to assure the quality of data; (3) to develop a scientifically sound chemical assessment system; and (4) to provide assessments of risk and exposure required to support toxic substances control actions.

A major feature of TSCA is the authority to require industry to test selected chemicals for their possible adverse effects on health and the environment. Adequate test data, which are currently unavailable for most chemicals, are a prerequisite to the evaluation of a chemical's risk. Such evaluations are needed to define and implement appropriate regulatory actions under TSCA and other statutes aimed at protecting health and the environment.

The testing authority of TSCA is implemented by promulgating rules specifying the chemicals to be tested and the "test standards" that are to be followed in performing the testing. The test standards, which TSCA requires to be reviewed and updated annually, specify the effects to be evaluated and the nature of the tests and test protocols to be followed in so doing. EPA will propose a structure of test standards to be referenced in adopting test rules for specific chemicals. These standards will first be based on existing validated test methods, and then will be expanded to cover other effects such as nuerotoxicity and overall ecosystem impacts. Based upon the required annual review, these test standards will be refined and improved.

Promulgation of test rules applying the relevant test standards to specific chemicals will be done in response to the semiannual recommendations of the TSCA Interagency Testing Committee (ITC) established by Section 4(e) of TSCA, as well as for other chemicals whose needs for testing have been identified through the evaluation process described below. As TSCA requires, within 12 months of receiving recommendations from the ITC, EPA will either initiate rulemaking to require the recommended testing or publish its reasons for not so doing.

Evaluating the hazards associated with production, use, and disposal of chemicals to determine if such activities pose unreasonable risks is the cornerstone of the TSCA program. Certain evaluation efforts, such as evaluating "notices of substantial risk" submitted by industry as required by Section 8(e), evaluating citizen petitions submitted under Section 21, and evaluating notices submitted by industry prior to the manufacture of a new chemical as required by Section 5 are based upon outside input. Other evaluation activities, such as systematic identification and assessment of potentially high-risk existing or new chemicals, are initiated by EPA and are critical to the effective application of TSCA regulatory authorities.

Chemicals of concern identified through review of substantial risk notifications and other sources will be entered into a multistage hazard evaluation process, with a decision being made at the end of each stage whether to continue on to the next, more intensive stage of evaluation. Alternate decisions at a given stage include dropping current consideration because of apparent low hazard potential, subjecting the chemical to testing requirements to fill critical data gaps, or referring the chemical to another program or agency having authority to deal with any apparent hazards. Chemicals having completed all evaluation stages will have received a full evaluation of their sources, exposure potential, and adverse effects, as well as an investigation of their existing regulatory controls and identification of possible control options to reduce health and/or environmental risks associated with their production, use, and disposal. Such evaluations will provide a basis for initiating suitable regulatory actions under TSCA or other relevant authorities.

Chemical Control - The goal of the chemical control program is to protect human health and the environment by controlling new and existing chemical substances that present unreasonable risks of injury to health or the environment. This goal will be accomplished through implementation of the premanufacturing notification, control regulations, and imminent hazard regulatory provisions of TSCA. The major objectives are determination of unreasonable risk based upon evaluation of chemical substances on health, environmental, social, and economic factors; use of the least burdensome type of control (regulatory or nonregulatory) necessary to reduce or prevent unreasonable risk; and provision of all the economic analysis necessary to implement TSCA.

One of the major functions of the chemical control program is to review notices and information regarding the manufacture of new chemicals (i.e., those not listed in the inventory of existing chemicals) and the manufacture or processing of chemicals for significant new uses. This includes review of the notices for compliance with applicable rules and guidelines and for "newness", action on exemption requests, review of data in the notices and information gathered through data systems searches and reporting requirements, determination of unreasonable risks, and taking of appropriate control actions informally, and under TSCA or recommending referrals to other programs within EPA or other Federal, State, and local government entities. Significant new use rules which require notification to EPA of new uses of new or existing chemicals determined to be significant based on exposre and other factors will be established.

Another function is to review information on the hazards, social, and economic aspects of existing chemicals (those listed in the inventory) in order to determine unreasonable risk and to limit or control the manufacturing, processing, distribution, use, or disposal of chemicals which pose or may pose unreasonable risks to health or the environment. An additional function is to conduct economic studies to support these actions as well as testing and evaluation, reporting and recordkeeping and to prepare necessary special economic analyses.

Information Integration - The TSCA information integration program is involved in a multiyear effort which will ultimately provide the toxic substances program, other EPA programs, and other Federal agencies dealing with toxic substances with comprehensive toxic chemical information development and storage and retrieval capabilities, and a cohesive Federal approach to controlling unreasonable risks associated with chemicals.

This will be accomplished through programs to: (1) obtain production, use, exposure, and similar information from industry using reporting and recordkeeping rules promulgated under the authority of Section 8 of TSCA for the use of the toxic substances program and others in assessing and regulating chemical hazards; (2) establish and use information storage and retrieval systems to serve the information needs of toxic substances and other programs, while maintaining adequate control of chemical information and data to assure the security of confidential business information; (3) provide environmental, human, animal, and biota monitoring and exposure studies to conduct analyses to predict future problems with chemicals in the environment, and to support risk assessments, premanufacturing review, and chemical control activities; (4) provide mechanisms and analytic support for coordinating and integrating the toxic substances program policies and activities with those of other EPA programs, EPA regions, State and local governments, public interest groups, other Federal agencies, and other countries; (5) provide information to assist industry in complying with TSCA provisions and provide feedback from industry regarding TSCA implementation.

Toxics Management - The goals of the regional toxics management program are to implement the objectives of TSCA at the State and local levels and to integrate the Agency's regional implementation of toxics activities in all media. The major objectives and functions to be accomplished are:

- More efficient and effective conduct of regional toxics activities through development and implementation of an integrated toxic substances control program within each region through media program coordination.

- Incorporation of State and local expertise into the national toxic substances program through establishment of cooperative programs with State and local programs on toxic substances program activities.

- Insuring the provision of adequate, timely and responsive assistance to industry within the region through management of a toxic substances industry assistance program.

- Insuring that the public is made aware of and provides input to toxic substances program activities through conduct of public information programs.

- Incorporation of regional perspectives into the national toxics program through participation in toxic substances strategy and regulations development.

- More efficient and effective Federal implementation and conduct of toxic substances activities through cooperation with other Federal agencies at the regional level on toxic substances program activities.

- Action on local problems and/or inclusion of them into the national program through identification, priority setting, and assessment of regional toxic substances problems.

- Incorporation of field data, into action on toxic substances through coordination and conduct of monitoring within the regions in support of the toxic substances program.

TESTING AND EVALUATION

1978 Accomplishments

In 1978, $5,239,000 and 74 positions were expended for this program. The implementation of a testing scheme was begun with the initial development of four health effects standards including oncogenicity, nononcogenic chronic effects, combined oncogenicity/nononcogenic chronic effects and good laboratory practices. Testing rule development was initiated for chemicals recommended by the Interagency Testing Committee. A multistage assessment process was inaugurated through which suspect chemicals are reviewed for hazard, and evaluations are made of potential risk of injury by hazardous chemicals to health and the environment: 35 early warning hazard assessments and two intermediate assessments were completed; two final assessments, asbestos and NTA, were initiated; and 240 notices from chemical manufacturers concerning substantial risk were evaluated.

1979 Program

In 1979, $17,195,600 and 171 positions are available for this program, including $13,100,000 for extramural scientific support of test standards development and assessment. We plan to have approximately 25 test standards under varying stages of development, including finalization of those initiated in 1978. These test standards will cover both health and ecological effects and will significantly expand the structure initiated in 1978. Test rules will be developed based upon these standards. Based on the work begun in 1978, test rules will be proposed covering approximately 40 chemicals, including those recommended by the ITC.

Depending upon the number of industry submitted substantial risk notices received by the Agency, we plan that 350 preliminary assessments (substantial risk evaluations, early warning, and intermediate assessments) will be completed. In addition, seven final assessments will be undertaken including completion of those begun in 1978. Testing and evaluation will also support the premanufacture review process which will begin in mid-1979 by providing as many as 110 total evaluations, as part of its multistage new chemical hazard/risk assessment process.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$305,200 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$311,400. A net increase of +$221,700 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. This increase was offset by the transfer of -$215,500 to other agency activities to support the costs of the most recent pay raise.

1980 Plan

In 1980, $36,645,000 and 243 positions are requested, including $26,258,000 for extramural testing and assessment support. These extramural resources will be used to obtain scientific data, evaluations, and laboratory work on effects, expose and test methods from universities, institutes, and laboratories in support of the development of test standards and the conduct of assessments. Development efforts will be in progress on approximately 37 test standards needed to cover critical health and ecosystem effects. We will begin to develop additional test rules covering approximately 50 chemicals and complete those from 1979. This will begin to establish a testing data base for future assessments.

Multilevel hazard/risk evaluation support to the premanufacture review program will be expanded to cover as many as 275 evaluation reports. Assuming that the rate of substantial risk notifications will be similar to 1979, existing chemical assessments will be expanded to include 375 preliminary assessments, and 10 final assessments. These assessments will form the basis for present and future control actions which may be warranted.

CHEMICAL CONTROL

1978 Accomplishments

In 1978, $1,224,800 and 33 positions were expended for this program. Development of the program for implementation of the premanufacture review section of TSCA (Section 5) was begun. This included development of draft rules, a draft notice form, and instructions for completion of the form.

For existing chemicals (Section 6), two final regulations were promulgated. The two were the Marking and Disposal Rule on polychlorinated biphenyls mandated by TSCA and the ban on chlorofluorocarbons in aerosol containers, which was a joint action with FDA and CPSC. A regulation banning manufacturing, processing, distribution and uses of polychlorinated biphenyls as called for by TSCA was proposed.

Economic analysis was provided to support the inventory regulation, the three regulations on existing chemicals listed above, and the development of the premanufacture review program.

1979 Program

In 1979, $7,800,400 and 117 positions are available for this program, including $4,800,000 for extramural support to economic analysis primarily and to the development of control regulations, with some support of the new chemical review process. Regulations and guidelines were proposed January 10, 1979, for the contents of premanufacture notices. Promulgation is expected by mid-1979. All of the 200 new chemical notices expected to be received will be reviewed for compliance and initially screened for hazard based on the notice data. Effects and exposure data will be screened and selected chemicals subjected to further scrutiny. Notices that do not comply or that have insufficient data will be reviewed for a possible prohibition or limitation order pending development of additional information; it is estimated that two of these actions may possibly be taken. Complete assessment packages will be prepared for only the most significant chemicals based on notice data, supplementary information, and risk assessments from testing and evaluation. If an unreasonable risk is determined to exist, an injunction or administrative order banning or controlling the chemical will be issued within the notice period. It is expected that one of these actions may be taken in 1979. Chemicals that are found to pose significant risks, but on which action cannot be taken within the time constraints, will be referred after expiration of the notice period for formal control action on an expedited schedule.

A few chemicals that do not warrant immediate controls but might do so in the future (e.g., if exposure were to increase) will be the subject of significant new use rules.

Arrangements will be made to provide to other offices or agencies information received in premanufacture notices that would be useful to implementing other statutes.

For existing chemicals, final rules regarding the TSCA bans on the manufacture, processing, distribution, and use of PCBs will be published, nonaerosol uses of chlorofluorocarbons will be addressed, development of generic labeling regulations will be started, a program relying on voluntary State/local action to control asbestos in school ceilings will be established, and the regulatory process will be initiated on several additional chemicals, some of which are expected to be referrals from premanufacturing review for expedited control action.

In addition to regulatory activities, EPA will develop procedures to issue quality control orders (used when a manufacturer or processor is producing a chemical or article with an undesirable contaminant) and to deal with imminent hazards (Section 7).

Activities will also include provision of economic analyses necessary to complete determinations of unreasonable risk and to assure cost-effective regulations; determination of the cost to the chemical industry of complying with recordkeeping and reporting regulations under TSCA; economic analyses to support regulation activities on chlorofluorocarbons, PCBs, labeling, and other chemicals; support to developing guidelines for submitting economic data with a premanufacture notice; support in assessing the economic impact of testing regulations. EPA will also perform studies required by TSCA to determine the circumstances and conditions under which indemnification should be accorded to any affected person for any actions taken under TSCA; to determine fair and equitable reimbursement to be paid those who develop test data which is then used by other chemical companies; and to define "small business" for purposes of exemption from recordkeeping and reporting requirements of TSCA.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$186,600 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$241,000. An increase of +$151,500 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. This increase was offset by the transfer of -$97,100 to other agency activities to support the costs of the most recent pay raise.

1980 Plan

In 1980, $12,131,400 and 164 positions are requested for this program including $6,357,800 for extramural support to control regulations development, premanufacture review, and economic analyses. By this time, the premanufacture review program will be fully established. About 400 notices are expected to be reviewed. Data provided from the notice, as well as additional data received from literature searches and reporting, will be used to select chemicals for complete assessments. Of these, nine may possibly warrant regulatory action. Procedures for other regulatory actions, such as significant new use rules will be in place and will be used as appropriate.

For existing chemicals, rulemaking will continue on those chemicals selected in 1979. Additional chemicals will be selected for control in conjunction with the risk assessment process and referrals of new chemicals which may present an unreasonable risk. In addition to regulations on individual chemicals, work will continue on generic regulations for classes of chemicals, perhaps including solvents, flame retardants, and benzidene dyes. A generic labeling regulation will be proposed.

Economic analyses will be completed for existing chemicals that are being regulated. Analyses will also be conducted on regulations under Section 5, and to support other toxic substances program regulations, including testing guidelines and recordkeeping and reporting.

INFORMATION INTEGRATION

1978 Accomplishments

In 1978, $4,360,900 and 69 positions were expended for this program. Information integration programs were established in the areas of Section 8 recordkeeping and reporting, toxic substances integration, chemical information systems and services, monitoring survey and analysis, and assistance to industry. In each of these areas, basic work was begun including planning and organizing the programs as well as providing needed support. In the case of industry assistance, the program was fully implemented and included maintaining nationwide toll-free telephone service for efficient response to inquiries, and distributing literature, copies of regulations requiring industry action, and requisite forms to industry. Specific program accomplishments in 1978 included: (1) promulgating the inventory reporting regulation; (2) processing 135,000 chemical reporting forms (65,000 chemicals) in preparation for inventory publication in 1979; (3) promulgating a rule to require submission of health and safety studies. as well as a substantial risk notification policy and interim guidelines on exports; (4) conducting feasibility and design studies and establishing basic data management systems; (5) preparing guidelines for protecting confidential chemical identities; (6) establishing basic data security procedures and facilities and making confidential data available under secure conditions; (7) providing information to industry to comply with requirements to report chemicals for inclusion in the Initial TSCA Chemical Substances Inventory, as well as other regulations; (8) conducting literature searches and monitoring studies as needed to support chemical testing, control and risk assessment activities; (9) establishing a pilot public participation program in one region; and (10) participating in the Interagency Regulatory Liaison Group (IRLG) and Interagency Toxic Substances Data Committee (ITSDC) which are establishing coordinated Federal policies and programs for risk assessments, information collection and exchange, common chemical identification codes and common work plans for 24 chemicals that are candidates for regulation.

1979 Program

In 1979, $14,741,000 and 94 positions are available for this program, including $11,216,000 in extramural support for information systems and services, monitoring and industry assistance support. Information integration will promulgate five new recordkeeping and reporting rules and use these and other rules to obtain chemical information from industry to continue building a comprehensive body of chemical information for support of regulation under TSCA and other laws. Guidance will be prepared for regional toxics personnel to assist them in developing and operating coordinated regional programs. Procedures for referrals of chemicals for regulation under authorities other than TSCA will be developed. Four regional programs (three of which are new) to encourage public participation in, and public input to toxic substances program activities will be funded. Cooperative efforts with other agencies will continue through the IRLG, ITSDC, and other interagency programs. Contracts will be funded in seven to 12 States for special projects, under the authority of Section 28 of TSCA. A secure, fully dedicated computer facility will be put into operation and the basic systems to provide data storage and retrieval will be available by the end of 1979.

The initial TSCA Chemical Substances Inventory will be published in 1979. Literature searching and other information support will be provided as required to support risk assessment, premanufacturing review, testing and regulatory actions. Systems design for a comprehensive interagency Chemical Substances Information Network (CSIN), of which the internal EPA system is an integral component, will be done in support of Section 10 of TSCA. The objective of the network is to link existing systems so that all available data on chemical substances are considered in regulatory decisionmaking. Materials balance studies will be conducted on the chemicals undergoing intermediate or final risk assessment to identify the sources of these chemicals in the environment. Field studies will be conducted to support risk assessments, testing and chemical control activities. A comprehensive monitoring program plan will be prepared, which will take into consideration toxic substances program needs and the ability of ongoing programs in other parts of EPA to meet those needs. Contact with industry will be provided by personal meetings and site visits. Industry will be assisted in complying with all regulations with services established in 1978. A special industry assistance effort will be launched in support of the newly implemented premanufacture notification program.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$135,200 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$71,400. An increase of +$121,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. This increase was offset by the transfer of -$185,600 to other agency activities to support the costs of the most recent pay raise.

1980 Plan

In 1980, $15,546,500 and 103 positions are requested for this program, including $11,524,000 for extramural support of information systems, monitoring and industry assistance. The 1980 program will build on the basic program capabilities and facilities put in place in 1978 and 1979. Three reporting and recordkeeping rules will be promulgated to (a) develop a broad base of information on a large number of chemicals in order to select high priority chemicals for further action, (b) gather specific information on selected chemicals in order to support the risk assessment and regulatory development processes, and (c) follow-up on the economic fate of new chemicals entering commerce through the premanufacture notification process. Interagency integration functions will continue to be carried out as a result of cooperative efforts with other Federal agencies through the IRLG. Regional efforts will be supported by establishing new programs to encourage public participation, updating the regional guidance, and maintaining day-to-day contact with regional toxics program personnel. The information systems and services program will maintain the dedicated computer facility established in 1979 to assure protection of confidential data and will develop computer linkages to several new data bases, and improve program compatabilities in data search, retrieval and analyses through system refinements and through the continued development of the Chemical Substances Information Network. The available information systems and services data analysis capabilities will be used to support risk assessment, testing and control actions and review of new chemicals which will be undertaken in 1980. The Initial TSCA Chemical Substances Inventory will be updated to include information reported by processors which was not included in the initial inventory and procedures for providing resolution of nomenclature problems associated with "new chemical" identification will be put in place. Environmental, human, animal and biota monitoring will be conducted to predict future problems with chemicals in the environment, and to

support risk assessments, premanufacturing review, and chemical control. Materials balances studies will be conducted to identify the sources of chemicals undergoing risk assessment. In addition, field studies and data analyses will be conducted to provide data with which to validate exposure and fate models developed in 1979 by testing and evaluation. The toxic substances program will also cosponsor monitoring projects with other EPA programs to identify risks posed by chemical substances in the environment. The industry assistance program will continue to maintain close liaison with industry through services developed in 1978 and 1979. In 1980, the program will provide extensive support to the premanufacturing review program by printing and mailing reporting forms, and by assisting industry in complying with the premanufacture notification requirements through technical information and training. These types of support will also be provided for testing requirements, control actions and reporting requirements that will be developed in 1980.

TOXICS MANAGEMENT

1978 Accomplishments

In 1978, $757,000 and 23 positions were expended for the regional toxic substances program. The regions have begun formulating and establishing the regional role in the toxic substances program. They have also begun staffing and organizing to implement the regional toxic substances program and some have completed these actions. The majority of program activity in almost every region has been provision of the required response to the initial influx of requests for assistance from industry on the inventory reporting, PCB, chlorofluorocarbon and other regulations. Essentially all regions have begun strong efforts to establish integrated toxic substances programs within the region. In a few instances regions have completed the first stages of development and are beginning implementation and operation. Most regions have also begun cooperative efforts with their States and localities on toxic substances program activities. The regions with the greatest amount of toxic substances related activity within the region have put some limited effort into the remaining toxic substances objectives of public information, strategy and regulations development, Federal agency cooperation, regional problems and monitoring, as well.

1979 Program

In 1979, $1,232,800 and 43 positions are available for this program. In 1979, most of the foundation building (organization, staffing, etc.) for regional program implementation begun in 1978 will be completed. Efforts toward all of the regional objectives will increase over 1978 and the relative levels of effort among the objectives will remain much the same. The integration function will receive the most substantial effort. Most regions will be actively developing their integration programs and moving to implement them, while those few which have already completed development will be operating and refining their programs. Almost all regions will increase their efforts to cooperate with the States and localities, primarily through exchange of information. A greater number of regions will be able to provide their input to increasing strategy and regulations development activities. As the national toxic substances program becomes operational, the regions will provide more support through increased coordination and conduct of monitoring, particularly in those regions with a high level of toxic substances activity. The regions will also expand their efforts to identify and assess regional toxic substances problems. Most regions will put a small amount of effort into coordinating with other Federal agencies and conducting public information programs.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,200 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$36,200. An increase of +$116,600 results from increased pay costs from the October 1978 (1979) pay raise as well as annualization of the October 1977 (1978) pay raise. Finally, as a result of the agency's ZBB review of resource requirements for its 1979 operating plan, -$81,600 was reprogrammed from this element to pesticides use management.

1980 Plan

In 1980, $1,219,900 and 43 positions are requested for this program. The 1980 regional toxics management program will be similar to that of 1979.

The regional toxics management program will consist of the following activities:

Integration programs begun in previous years will be maintained, improved, and refined in essentially all regions. This function will remain as the highest priority program for regional efforts.

Essentially all regions will continue their efforts to ensure that assistance to industry is provided. The demand for regional assistance overall is expected to remain at a level somewhat lower than the first-year of program implementation. Most regions will maintain their efforts to cooperate with States and localities to exchange information and develop approaches to control on toxic problems.

The regions will continue to conduct problem identification and assessment and monitoring activities in support of the toxic substances program, particularly in the regions with a greater level of toxic substances related activity. Most regions will continue their public information programs and will respond to public inquiries and requests. The regions will also continue their participation in strategy and regulations development and cooperation with other Federal agencies.

Enforcement

TOXIC SUBSTANCES

Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Toxic Substances Enforcement	$1,250	$4,630	$3,156	$3,796	+$640
Permanent Positions					
Toxic Substances Enforcement	31	85	70	78	+8
Full-time Equivalency					
Toxic Substances Enforcement	...	...	75	82	+7

Budget Request

A total of 78 positions and $3,796,000 is requested in 1980. These resources are to carry out the enforcement provisions of regulations implementing the Toxic Substances Control Act (TSCA) and to enforce the provisions of the Act. The increase of eight positions and $640,000 is necessary because of the increased number of enforceable rules promulgated under the Act which will require enforcement in 1980.

Program Description

The EPA toxic substances enforcement program is administered pursuant to the Toxic Substances Control Act (TSCA). The toxic substances enforcement program is responsible for developing the enforcement provisions of regulations implementing the Toxic Substances Control Act (TSCA) and for enforcing the Act. The enforcement program is involved in the development of regulations to control specific chemical substances and mixtures and in the preparation and execution of enforcement strategies to implement these regulations.

The toxic substances enforcement program also engages in response to toxic emergencies involving substantial threats to public health and safety and in taking appropriate action to abate such emergencies, either through legal proceedings or by other appropriate means.

A major function of the toxic substances enforcement program is the inspection of chemical manufacturing, processing, and distribution facilities whose activities are regulated under the Act and its implementing regulations. Inspections of such facilities in turn lead to prosecutions of violators discovered during the inspections. Violators may be prosecuted either through civil proceedings, or by judicial proceedings in which a court may impose a number of civil or criminal sanctions.

1978 Accomplishments

During 1978, the delegation of TSCA inspection and enforcement authority to the regions was completed. Rules of practice for enforcement and compliance related hearings and an interim penalty policy were developed. A feasibility study on enforcement ADP needs was completed. Identification of regional and headquarters personnel for coordinated response to emergencies was made. Enforcement strategy, compliance monitoring policy, and inspection procedures for the PCB marking and disposal regulations and Section 8(b) inventory were developed. Also developed were draft enforcement strategies for the PCB ban, the chlorofluorocarbon regulations, and initial procedures for chemical imports.

In the regions, 1978 marked the start-up year for the program. The regions supported the development of integrated toxic substances control plans and investigated several Section 8(e) Substantial Risk situations.

Resources for this program were $1,250,000 and 31 positions. Contracts in the amount of $167,000 were established for inspection support, analyses of cooperative State agreements and toxic penalty policies, and revision of inspector, attorney, and case proceedings manuals.

1979 Program

The 1979 toxic substances enforcement program will have as its first priority at both heaquarters and in the regions the initiation of enforcement actions in emergencies involving substantial threats to public health and safety. Other programwide responsibilities include an emphasis upon toxic substances control enforcement as developed under TSCA, the improvement of enforcement methods through greater cooperation with States and Federal agencies, and emphasis upon development of cases of national or regional significance. Additional important activities include development of a final penalty policy and completion of PCB ban and chlorofluorocarbon enforcement strategies, compliance monitoring policies, and inspection procedures. Final chemical import procedures will be developed. Headquarters staff will provide support to the regions in case development and prosecution and assistance to the Office of Toxic Substances in the development of new regulations. Identification of regulatory audiences affected by, and development of enforcement strategies, compliance monitoring policies, and regional implementation guidance for, all new regulations will be completed.

In addition to the programwide priorities noted above, the regional offices will conduct about 500 inspections related to Section 6 chemical control regulations including PCB marking and disposal, PCB ban, and chlorofluorocarbon ban, and about 30 inspections of facilities subject to the requirements of Section 4 (testing), 5 (premanufacture notification and unreasonable risk), 8 (chemical information and substantial risk), and 13 (imports), including investigations of noncompliance with Section 8(e) requirements of notification of substantial risk. Enforcement action will be initiated as appropriate.

Fiscal year 1979 resources for this program are $3,156,000 and 70 positions. Contract funds amount to approximately $1,310,000 and will be used for sample chemical analysis and compliance monitoring inspections.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,474,000 results from several actions. First, Congress applied a $3 million reduction for position lapse rate to the Abatement and Control and Enforcement appropriations; -$72,600 was applied to this activity. Second, an increase of +$181,400 is due to increased paycosts associated with the October 1978 (1979) pay raise and distribution of the October 1977 (1978) pay raise. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$1,582,800 was reprogrammed from this element and is attributed to increases in regional water quality enforcement ($873,000), noise enforcement ($31,900), regional

1980 Plan

A total of 78 positions and $3,796,000 is requested in 1980. These resources are to carry out the enforcement provisions of regulations implementing the Toxic Substances Control Act (TSCA) and to enforce the provisions of the Act. The increase of eight positions and $640,000 is necessary because of the increased number of enforceable rules promulgated under the Act which will require enforcement in 1980.

In 1980, the toxic substances enforcement program will have as its first priority the initiation of enforcement actions in emergencies involving substantial threats to public health and safety. Toxic substances control enforcement as developed under TSCA and the improvement of enforcement methods through greater cooperation with States and Federal agencies will be emphasized, as will the development of cases of national or regional significance. Headquarters staff will be responsible for the management and execution of national programs to implement and enforce Section 4 testing regulations, Section 6 chemical control regulations (PCB marking and disposal, PCB ban, and chlorofluorocarbon ban), Section 12 export requirements, and Section 13 import requirements. Headquarters will be responsible for enforcement input into regulation development directed by the Office of Toxic Substances, and for support to the regions in case preparation and prosecution. In selected criminal cases and appealed civil cases, the headquarters staff may participate directly in case prosecution. Response to suits brought under Section 20 (citizens civil actions) will also be a headquarters function, as will establishment and managemnt of a national contract for contract for inspection and sample analysis functions, and the audit, appraisal, and evaluation of the national TSCA enforcement program. Technical support will be provided to the regions in major enforcement cases. Finally, toxics enforcement policy statements (TEPS) will be prepared and published to alert the public to major enforcement policy determinations.

In addition to the programwide priorities noted above, the regional offices will conduct about 600 inspections of facilities subject to Section 6 chemical control regulations including PCB marking and disposal, PCB ban, and chlorofluorocarbon ban, with emphasis on PCB enforcement activities. Inspections of about 40 facilities subject to Section 4 testing requirements, Section 8 chemical information reporting requirements, and Section 13 import requirements will be made and enforcement actions will be initiated as appropriate. Voluntary compliance with statutory requirements by industry will be stressed through contacts with State enforcement personnel and affected industry representatives,

The 1980 resources requested for the toxic substances enforcement program are 78 positions and $3,796,000. Approximately $1,025,000 is designated for contracts and will include laboratory analyses of samples, inspection support, revision of enforcement strategies, and implementation of interagency enforcement projects which will support the toxic substances enforcement program.

Energy

Energy

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs 1979
			(dollars in thousands)		
Research and Development:					
Appropriation.....	$133,063	$114,765	$112,037	$102,461	-$9,576
Permanent Positions....	160	146	149	140	-9
Full Time Equivalency..	...	...	268	265	-3
Total, Energy Program:					
Appropriation.....	$133,063	$114,765	$112,037	$102,461	-$9,576
Permanent Positions....	160	146	149	140	-9
Full Time Equivalency..	...	...	268	265	-3
Outlays.....	118,245	125,500	127,148	125,000	
Authorization Levels...	Authorization is contained within the Federal Water Pollution Control Act and the Clean Air Act. Authorization levels for these Acts are shown under the water quality and air media descriptions.				

OVERVIEW AND STRATEGY

Environmental quality is influenced both by the structure of the Nation's economic activities for resource extraction and manufacture and by the technological capabilities of available pollution controls. The Nation is now striving to reduce its dependence upon scarce clean fuels, particularly foreign petroleum. The development of domestic energy resources to power the Nation's industry may pose a variety of threats to environmental quality. One of the Agency's major objectives is to protect the public health and welfare from adverse environmental effects associated with the shift from petroleum and natural gas to coal. Research and development toward this end is mandated by the Clean Air Act and the Federal Water Pollution Control Act. Effective control of the environmental impact of changes in the Nation's energy systems must be based on a sound understanding of the likely course of energy development and must be accomplished in a reasonable manner at an acceptable cost.

The increased use of coal has the potential of degrading environmental quality. Potential problems include increased exposure of the population to air pollutants, degradation of water quality, increased acid rain and soil leaching, decreased visibility, and impaired productivity of strip mined land. The air pollutants of greatest concern are sulfur and nitrogen oxides in both gaseous and particulate forms, other fine particulate material, and organic carcinogens. Water pollution problems include acid rain drainage, salt leaching, run-off and flow reduction. The environmental significance of many of these problems is not presently well understood. Decisions on energy developments will have unnecessary adverse consequences if they are made without the benefits of improved understanding. Improved knowledge of the behavior and effects of coal pollutants will allow more rational decisions as to acceptable development levels and required control measures.

Accelerated coal use will engender a variety of environmental issues. The program is designed to provide the technical information necessary to sound decision making. The environmental problems of energy processes must be understood. Information on the costs and capabilities of control alternatives must also be developed. Some of the areas in which information is lacking include: (1) the effectiveness of mining and reclamation measures to control air and water pollution and to restore land productivity, (2) the biological effects of oil spills, (3) the characterization of toxic materials from combustion or fuel processing operations, (4) the behavior, persistence and fate of air and water pollutants released from energy production and (5) understanding of cumulative regional environmental impacts of energy development and the costs of control programs for mitigation.

New energy technologies, particularly those based on incomplete combustion for the generation of synthetic fuels, have the potential of creating new pollutants with serious implications for public health. The Department of Health, Education, and Welfare (DHEW) and the Department of Energy (DOE) are working with EPA to identify the health and environmental effects of each advanced technology. EPA and DOE are developing procedures for establishing environmental standards for new technologies.

Because of the potentially acute health and ecological effects associated with these energy initiatives, and with both existing and new technologies for fuel processing, conversion, and utilization, EPA has made a major commitment to ensuring that the environment and human health are protected. Many of the problems are long term, and many technologies will not be available before 1985 or in commercial use before 1995. However, EPA must have programs under way now to develop the health and technical data necessary to support energy related environmental quality standards and source discharge or emission regulations. The lead times for health assessment and control technology development are such that research programs must be implemented now if energy development is to be compatible with environmental protection.

Several long term problem areas are anticipated for the regulatory and enforcement components of the Agency. The utilization of substitute fuels from coal and oil shale, requiring cleaning, gasification, liquefaction, and other processing techniques, can generate new pollutants whose effects are not known and must be defined. For example, coal gasification processes may emit unacceptable quantities of carcinogenic materials. Another problem area concerns the potentially cumulative chronic health and ecological effects of pollutants from new and emerging energy sources such as advanced combustion systems and geothermal facilities.

The Agency must also address many energy related environmental problems in the near-term. The problems are not limited to the control of air pollution from coal combustion. The increased use of coal and oil shale will accelerate in semiarid western areas, raising serious questions about restoration of mined lands and degradation of the quality of available ground and surface water resources. The expanded interest in offshore oil may lead to increasing the severity of the environmental problems associated with petroleum extraction and transportation and the coastal refining facilities.

The primary short term goals of the energy research and development program are: (1) to provide a sound data base necessary for the Agency to establish regulations and incentives to encourage the use of environmentally acceptable practices in extraction, processing and utilization of energy resources, and (2) to provide environmental control options, as soon as practicable, for those extraction, processing and utilization practices which cause significant health and ecological damage.

The approach for addressing the near-term pollution problems involves reducing the air and other pollution effects associated with expanded coal use. At the present time, the available options for controlling nitrogen oxide emissions from stationary sources are not capable of halting the growth of the national emissions inventory. New Source Performance Standards are based upon best demonstrated control technology. The nitrogen oxide emissions limitation for coal combustion is more than two times that for oil and three times that for natural gas. Combustion modification techniques can reduce emissions and the program will develop and demonstrate new burner designs that can reduce coal-fired emissions to levels comparable to those obtainable with oil or gas.

The determination of the environmental problems and requirements for control of the longer-term energy supply systems is of particular importance. Although EPA is not responsible for energy technology development, per se, it is working in concert with the Department of Energy and other agencies to ensure the environmental compatibility of such technology. The approach used is to: (1) conduct environmental assessments of emerging energy extraction, processing and utilization techniques to identify new pollutants and determine their potential health and ecological effects; (2) develop an adequate scientific basis for new environmental regulations; (3) provide guidance on control technology requirements to Federal and industry groups developing new technologies; (4) assist in the development of control technologies, especially where the Office of Research and Development has particular expertise; and (5) assess the adequacy of existing control technologies.

The implementation scheme, designed to maximize the useful output of the program, involves an extramural approach with EPA relying heavily on expertise available within both the Federal and industrial sectors. In fact, EPA manages, coordinates and integrates the efforts of 17 Federal agencies under the auspices of the Interagency Energy/Environment Program. In addition to the major interagency components of the program, much of the research and development program is performed by industrial organizations and universities via contracts and grants.

Each of the participating Federal agencies or departments has its own charge -- management of Federally owned resources, management of Federal lands, the development of new fuel sources or cycles, etc. In pursuing its own programs and responsibilities, each agency must have access to the available information on the environmental effects of energy development and must also perform the research necessary to provide needed additional data. The EPA management of the interagency program attempts to minimize the overlap of the separate research programs and assure a comprehensive coverage of all environment/energy questions. In addition, the results of the multiagency research program are disseminated and reviewed through a system of publications, joint conferences and symposia supported by EPA's Office of Energy, Minerals, and Industry.

The energy research and development program is reviewed within the Agency's research planning and zero based budgeting procedures. The Agency has formed a number of research coordinating committees to review activities in support of regulatory programs. The activities on inhalable particulates were included in the control, transport and health effects purview of the research coordinating committee on fine particulates. Research on cooling tower blow down and discharges from ash and sludge ponds was reviewed in the coordinating committee in support of effluent guidelines.

SUMMARY OF INCREASES AND DECREASES	(in thousands of dollars)
1979 Energy Program.....	$112,037
Research and Development.....	-9,576
The decrease is comprised of reductions in conservation, utilization, and technology assessment $5,702,200 and in health and ecological effects, $4,045,100. These reductions are offset by an increase in fuel extraction and processing technology $171,400.	
1980 Energy Program.....	102,461

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An appropriation of $102,461,000 is requested for 1980 under the Research and Development account. This represents a net decrease of $9,575,900. EPA's zero based budget review reflecting overall priorities dictated this reduced funding level.

An increase of $545,700 is requested in fuel processing. The increase will be used to expand the capability to participate in the environmental assessments of oil shale retorting and coal liquefaction and gasification processes. An increase of $287,200 is also requested in nitrogen oxide control in order to accelerate our low NO_x pulverized boiler activities.

The other control technology programs will be decreased by $6,363,700. Of this amount the environmental assessment of conventional and advanced energy systems will be decreased by $3,834,300 and the evaluation of particulate control alternatives by $863,300; the development and evaluation of alternative mining practices by $374,300 and the development of flue gas sulfur oxide technology by $1,291,800.

$1,429,800 will be in the area of ecological effects of energy production of which 1.7 million will be in the area of health effects research. Baseline surveys in offshore oil development areas will be curtailed. The program in transport and fate will be decreased by $1,196,700 and the program in measurement and instrumentation increased by $271,900.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.....	$114,765
Congressional increase/decreases:	
Contractual services and monitoring and technical support.....	-730
Effect of October 1978 pay raise partial absorption.....	+83
Proposed October 1978 pay raise supplemental.....	+149
Annualization of October 1977 pay raise...	+296
Office of Research and Development reprogramming.....	-2,526
Current 1979 estimate.....	112,037

Congressional changes result from the $6 million reduction to contracts and monitoring and technical support, of which $730,000 is applied to the energy media.

Pay raise costs result in a total increase of $528,000 over the original estimate. The agency request included all funds for the October 1977 pay raise in the management and support media, to be distributed to other media at a later date. The increase reflected represents the share of this later distribution.

The Office of Research and Development reprogrammed $2,526,000 to the interdisciplinary media.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations.....	$131,943	$112,246
Effect of congressional changes.....	-500	...
Effect of October 1978 pay raise.....	+250	...
Effect of reprogrammings.....	-1,500	...
Program decrease.....	-15,000	-9,500
Change in amount of carryover funds available.....	-2,947	-209
Change in rate of obligation.....	...	...
Total estimated obligations.....	112,246	102,537
(From new obligation authority).....	(111,206)	(101,706)
(From prior year funds).....	1,040)	(831)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The effect of the congressional change discussed in the previous section is a decrease of $500,000. The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $250,000. The effects of the Office of Research and Development reprogramming is a decrease of $1.5 million.

The decrease in 1979 budget authority from the 1978 level will decrease obligations by $15 million. In 1980, the decreased authority will result in a reduction to obligations of $9.5 million.

The amount of carryover funds to be obligated in 1979 is $705,000, a decrease of $2,947,000 from the 1978 level. In 1980, it is estimated that $496,000 will be obligated, a decrease of $209,000.

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs 1979	Page
Appropriation						
Fuel Processing, Preparation and Advanced Combustion ...	$24,153	$11,949	$12,598	$13,144	+$546	E-10
Fuel Extraction	7,091	3,370	3,407	3,033	- 374	E-14
Impact of Conventional and Advanced Energy Systems ...	17,407	17,459	17,228	13,394	-3,834	E-17
Flue Gas Sulfur Oxide Control	11,604	2,099	3,181	1,889	-1,292	E-27
Nitrogen Oxide Control.....	21,275	14,850	13,528	13,815	+287	E-30
Flue Gas Particulate Control.	14,183	9,889	8,863	8,000	-863	E-33
Effects of Energy-Related Pollutants on Organisms and Ecosystems.....	11,200	15,844	16,078	14,648	-1,430	E-37
Transport and Fate of Energy Related Pollutants.....	4,528	9,110	8,811	7,614	-1,197	E-40
Measurement Systems and Instrumentation Development for Energy Related Pollutants.....	9,344	9,485	8,265	8,537	+272	E-44
Health Effects of Energy Related Pollutants	12,278	20,710	20,078	18,387	-1,691	E-48
ENERGY TOTAL	133,063	114,765	112,037	102,461	-9,576	
Permanent Positions						
Fuel Processing, Preparation and Advanced Combustion....	43	43	44	47	+3	
Fuel Extraction	24	24	24	22	-2	
Impact of Conventional and Advanced Energy Systems ...	24	27	28	20	-8	
Flue Gas Sulfur Oxide Control	10	6	5	5	...	
Nitrogen Oxide Control	20	23	23	23		
Flue Gas Particulate Control.	15	17	15	13	-2	
Effects of Energy Related Pollutants on Organisms and Ecosystems	2	2	3	3	...	
Transport and Fate of Energy Related Pollutants.....	2	1	3	3	...	
Measurement Systems and Instrumentation Development for Energy Related Pollutants	15	1	1	1	...	
Health Effects of Energy Related Pollutants.....	5	2	3	3	...	
ENERGY TOTAL	160	146	149	140	-9	

	1978	1979	1979	1980	1980 vs 1979
Full-Time Equivalency					
Fuel Processing, Preparation and Advanced Combustion....	...	...	62	72	+10
Fuel Extraction.....	...	...	38	32	- 6
Impact of Conventional and Advanced Energy Systems....	...	...	36	32	- 4
Flue Gas Sulfur Oxide Control			7	8	+ 1
Nitrogen Oxide Control.....	...	...	33	35	+ 2
Flue Gas Particulate Control.	...	...	21	23	+ 2
Effects of Energy-Related Pollutants on Organisms and Ecosystems.....	...	...	17	16	- 1
Transport and Fate of Energy Related Pollutants.....	...	...	8	7	- 1
Measurement Systems and Instrumentation Development for Energy-Related Pollutants.....	...	...	39	34	- 5
Health Effects of Energy Related Pollutants.....	...	...	7	6	- 1
ENERGY TOTAL			268	265	-3

Budget Request

An appropriation of $102,461,000 and 140 positions is requested for 1980. This represents a decrease of $9,575,900 and nine positions from 1979.

Program Description

The energy research and development program is designed to determine the environmental implications and effects of the Nation's energy development efforts. This energy/environment research and development program involves 17 Federal agencies. A comprehensive plan to classify program content and resources has been developed to assure that the entire range of Federal energy/environment research and development program is woven together into a manageable framework. This plan identifies research areas by the type of energy resource, the processes in obtaining and using the energy, and the scientific disciplines required for research on environmental impacts. The program also includes the development of pollution control options for conventional energy systems and the assessment of the environmental problems or advantages of new energy technologies being developed by the Department of Energy

In addition to its activities with other agencies, EPA conducts, within its own laboratories, a widely diversified program. EPA coordinates with other Federal agencies now performing related research and development. This is accomplished by annual reviews resulting in updated program planning documents which, when approved, serve to obligate that year's "pass-through" funds. EPA coordination minimizes the duplication of effort of the other Federal agencies.

The program is divided into two broad segments. The health and ecological effects program consists of the research activities associated with the behavior and effects of energy related pollutants once they are in the environment. The control technology program is designed to provide information on the types and quantities of pollutants released by energy supply activities and to develop or stimulate the development of control options where necessary. This technology research program is further divided to group research on the activities associated with fuel extraction and processing separately from that research on energy conservation and utilization. The control technology program consists of six subprograms -- fuel processing, preparation and advanced combustion; fuel extraction; environmental impacts of conventional and advanced energy systems; flue gas sulfur oxide control; nitrogen oxide control; and flue gas particle control. The

environmental effects research program has four subprograms -- the effects of energy pollutants on organisms and ecosystems; transport and fate of energy related pollutants; measurement systems and instrumentation development; and health effects of energy related pollutants.

The specific objectives of the program's major components are discussed below:

Fuel Processing, Preparation and Advanced Combustion -- This program participates in the development of advanced technologies for fossil fuel processing by providing environmental assessments; bench-scale research, technology assessments and guidance in process control technology. The program will work in close cooperation with the Department of Energy process development and environmental programs to identify and quantify all residuals from fluidized bed combustors, synthetic fuels from coal processes, oil shale development, and coal cleaning. Comprehensive environmental assessments will be performed for these technologies to anticipate the severity of each environmental threat and corresponding means for control.

Fuel Extraction -- the energy resource extraction program deals with environmental quality problems associated with the technologies and processes for obtaining fuels; oil or natural gas extraction; oil shale development; and coal mining. The major purposes of the research program are: (1) to assess the existing and potential adverse environmental impacts from active and planned oil and gas production, storage and transportation (2) to develop methods, technology, and equipment to prevent, control, and abate environmental pollutants from these operations including spill clean-up; and (3) to document the technical/operational feasibility and cost effectiveness of environmental control options.

Environmental Impact of Conventional and Advanced Energy Systems -- Research in this program is designed to assess environmental risks, conduct bench-scale system and/or control technology research and identify environmentally, socially, and economically acceptable alternatives for modified conventional energy systems, advanced energy supply concepts, and energy conserving techniques. The program, which will assist EPA in selecting policies and in setting environmental standards, comprises comprehensive environmental assessments of energy systems. These integrated technology assessments quantify the cost/risk/benefit tradeoffs of energy systems and pollution control alternatives. A comprehensive assessment of unregulated and regulated residuals from conventional combustion sources is one major project of this program. Other environmental assessments included in this program will examine: industrial energy conservation, wastes as fuels, solar energy, energy-related solid and waterborne residuals, geothermal energy, waste heat recovery, and advanced energy cycles.

Flue Gas Sulfur Oxide Control -- This program develops and evaluates alternative technologies for the removal of sulfur oxide emissions from flue gas at electricity generating plants and industrial boilers. The aim of the program is to develop technical data on which EPA may establish emission standards for sulfur-emitting sources. Efforts are underway to evaluate existing sulfur oxides removal installations, to assess other impacts of flue gas desulfurization technology, and to assess the applicability of FGD technology to industrial boilers and other sulfur oxide sources.

Nitrogen Oxide (NO_x) Control -- The purpose of this program is to develop the best practicable combustion technology for the control of NO_x emissions from the leading categories of stationary sources and diesel engines. Stationary source categories include utility boilers, commercial/industrial boilers, residental heating systems, stationary engines, and advanced combustion processes. Advanced combustion processes such as advanced coal burners and coal burner systems are being studied and fundamental engineering and analytical support studies are also being conducted to evaluate the potential of these advanced methods for NO_x emission control and energy conservation. The research on controlled combustion also include fuel conditioning for sulfur oxide removal.

Flue Gas Particulate Control -- This program identifies and develops effective practicable technology to control aerosol emissions from man-made sources. Source categories addressed include industrial combustion, or energy processes. Major research efforts in the program are: assessment and extension of the capability of conventional systems (electrostatic precipitators, scrubbers, or fabric filters) for abating aerosol emissions; exploration of new and improved methods of control; and bench-scale investigation of specific control methods for major problem sources (low sulfur coal combustion, new fuels, power production, and selected industrial processes).

Effects of Energy Related Pollutants on Organisms and Ecosystems -- Research efforts develop the ecological data on freshwater, marine, estuarine and terrestrial ecosystems which will permit reliable estimates of the risk associated with accelerated development and utilization of domestic energy resources. This work is accomplished by the Department of Energy, Department of the Interior, National Institute of Environmental Health Sciences, National Oceanic and Atmospheric Administration, Tennessee Valley Authority, U.S. Department of Agriculture and the Environmental Protection Agency with funds made available to the Federal Interagency Energy/Environment Program. The various participating agencies have an array of technical expertise covering many disciplines.

Transport and Fate of Energy Related Pollutants -- The transport processes area traces the transmission by air, water, and soil of pollutants emitted from energy operations from their sources to their destination in man and the environment. Additionally, it covers the physical and chemical changes that the pollutants undergo during their transport. Emphasis in air transport research is on conversion of sulfur and nitrogen oxides, chiefly from coal burning power plants, to sulfates and nitrates. Formation and transport of photochemical oxidants from various energy sources is also emphasized.

Measurement Systems and Instrumentation Development -- The purpose of this activity is to focus and coordinate the research and development on energy-related measurements and instrumentation which is being performed by the Department of Energy, National Aeronautics and Space Administration, National Bureau of Standards, National Institute of Occupational Safety and Health, National Oceanic and Atmospheric Administration and the Environmental Protection Agency. This activity has two closely related but distinct research objectives.

The first objective is to provide baseline and trend data in those geographical regions where expanding energy development is projected to have a major impact on air, water, or land. Advanced monitoring techniques are needed to support such studies,

The second objective is to develop measurement methods and instrumentation for energy-related pollutants in ambient air and water which result from new energy technologies and expanding energy development.

Health Effects of Energy-Related Pollutants -- The purpose of this activity is to provide a coordinated effort in the energy-related health effects research undertaken by the Department of Energy, National Institute of Environmental Health Sciences, National Institute of Occupational Safety and Health, and the Environmental Protection Agency with the funds made available to the Interagency Energy/Environment Program. The objective of this activity is the development of energy-related health data which will permit reliable estimates of risk to human health associated with increased development and utilization of domestic energy resources. The health effects program examines possible chronic toxic effects of pollutants, including respiratory effects and cancer production.

ENERGY

Research and Development

Fuel Processing, Preparation and Advanced Combustion

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs 1979
			(dollars in thousands)		
Appropriation.....	$24,153	$11,949	$12,598	$13,144	+$546
Permanent Positions..	43	43	44	47	+3
Full-time Equivalency	...	...	62	72	+10

Budget Request

An appropriation of $13,144,000 is requested for 1980. This represents an increase of $545,700 and three positions over 1979. The increased resources will be used to provide additional support for characterizing emissions from, and developing control technology for, oil shale processes.

Program Description

The program includes the characterization of effluents and emissions, assessment of related environmental impacts, and development and evaluation of necessary pollution control technology for various fuel processes. The results of this effort are used as input in the Agency's standard setting process. Fuel processes assessed include: (1) coal cleaning (2) fluidized bed combustion and synthetic fuels generation from coal, biomass and oil shale.

1978 Accomplishments

As of September 1978, obligations included $17,895,000 for contracts, $2,179,700 for grants and $1,332,000 for interagency agreements. Significant accomplishments in 1978 in the areas of coal cleaning, fluidized bed combustion, synthetic fuels from coal and biomass and oil shale processing are as follows:

Coal Cleaning

- Studies of the microwave desulfurization process indicated up to 95% reduction of pyritic sulfur and 60% reduction of organic sulfur in coal.

- A major international symposium to discuss the potential of coal cleaning for compliance with sulfur dioxide (SO_2) emission regulations was hold.

Fluidized Bed Combustion (FBC)

- Tests on the pressurized FBC Miniplant, operated by Exxon, indicated that three stages of conventional cyclones may provide sufficient particulate removal to protect the gas turbine.

- Two-stage-combustion studies in the bench-scale atmospheric FBC unit at our Industrial Environmental Research Laboratory (IERL-RTP) indicated simultaneous high SO_2 removal (up to 90%) and low nitrogen oxide (NO_x) emissions (less than .2 lbs per million BTUs).

- Initial environmental testing at the Miniplant FBC facility has revealed trace metals in solid wastes at levels which could cause environmental damage.

Synthetic Fuels From Coal

- An EPA-funded synthetic fuels environmental control facility (the first of its kind) was dedicated at N.C. State University. Tests were initiated to evaluate control techniques for the generation of clean synthetic gaseous fuels.

- Initial environmental assessment of low BTU coal gasification processes identified discharges with potential health and ecological problems.

- Studies of the Solvent Refined Coal process indicated SO_2 reduction of 60% to 75% and particulate removal of up to 85%.

- Studies to characterize pollutants generated during in-situ coal gasification of Western coal, Eastern coal and Texas lignite were initiated.

Fuel From Biomass

- Biomass production and energy conversion processes were described and evaluated. Six regional scenarios were described and subjected to environmental analysis.

Oil Shale

- Methodology and results of sampling and analysis of waste streams at the Paraho oil shale demonstration facility were described.

1979 Program

The total resource allocation for this program is $12,598,300. Of this amount, $7,671,000 is for contracts, $2,450,100 is for grants and $414,000 is for interagency agreements. For 1979 the total allocation is divided among the various sub-program areas as follows:

Coal Cleaning	$ 1,325,000
Fluidized Bed Combustion	4,354,000
Advanced Oil Processing	428,000
Synthetic Fuel from Coal	4,850,300
Synthetic Fuel from Shale	1,641,000
TOTAL FUEL PROCESSING	$12,598,300

During 1979, EPA is conducting a major environmental assessment effort in low and high BTU coal gasification, coal liquefaction and fluidized bed combustion, and oil shale processing as well as the chemically active fluidized bed (CAFB) process. This effort will provide a data base and recommendations for the Agency's standard setting offices. Planned activities include:

- Conduct environmental testing at the GPU-Penelec Homer City, Pa. physical coal cleaning site.

- Startup, shakedown and operation of the chemically active fluidized bed (CAFB) demonstration facility at San Benito, Texas.

- Update data base for New Source Performance Standards (NSPS) for fluidized bed combustion (FBC) based on environmental assessments at Rivesville, West Virginia and Georgetown University boilers.

- Conduct comprehensive analysis of emissions from Wellman-Galusha and Willaputte-Chapman low BTU coal gasification processes.

- Conduct bench-scale tests for pollution control methods and devices for the Paraho reporting of oil shale.

- Characterize effectiveness of existing add-on devices for cleanup on the Georgetown University boiler.

- Evaluate FBC solid waste disposal methods.

- Conduct environmental assessment of SRC II (solvent refined coal) coal liquefaction process.

1979 Explanation of Changes From Budget Estimate

The net increase of +$649,300 results from several actions. A net increase of +$68,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of congressional appropriation changes affecting the planned exchange of functions with the Department of Energy, +$581,000 was reprogrammed within this activity from environmental assessment of conventional and advanced energy systems.

1980 Plan

The total resource allocation for this program is $13,144,000. This represents an increase of $545,700 and three positions over 1979. The increased resources will be used to provide additional support for characterizing emissions from, and developing control technology for oil shale processes. Of the $13,144,000 requested for 1980, $8,095,000 is planned for contracts, $2,550,500 is planned for grants and $443,600 in planned for interagency agreements. The environmental effects of the selected technologies will be characterized to provide input for EPA standard setting offices. The program plans provide for:

- Methods for sampling, analysis and continuous monitoring of emissions to quantify total organics, characterize toxics and determine inorganic compounds from coal processing technologies will be developed.

- Environmental assessment activities including characterization of emissions, and incorporating health, ecological and economic data, will be conducted at processing facilities such as Anvil Points (oil shale), Rivesville (FBC), Homer City (coal cleaning), University of Minnesota (low BTU coal gasification) and San Benito (CAFB).

- The data base for FBC will be expanded by characterizing electrostatic precipitators on EPRI atmospheric FBC facilities and by characterizing particulate control devices on DOE industrial FBC facilities.

- The data base for low BTU coal gasification will be expanded by evaluating associated sulfur compound control technology.

- Standard Support Plans (SSP) providing a schedule of outputs for Agency standard-setting offices will be produced for coal cleaning, FBC and synthetic fuels from coal.

- Environmental assessment reports (EAR) will be prepared for low BTU coal gasification and FBC.

- Oil shale control technology needs will be assessed.

- The mechanism of NO_x formation in FBC will be investigated.

- Air pollution control technologies for in-situ coal gasification will be evaluated.

- EPA regional offices will be provided with technical support in the form of discharge permit limits relating to coal cleaning, oil shale and coal gasification processes.

ENERGY

Research and Development

Fuel Extraction

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase+ Decrease- 1980 vs 1979
			(dollars in thousands)		
Appropriation.	$7091	$3370	$3,407	$3033	-$374
Permanent Positions. .	24	24	24	22	-2
Full-Time Equivalency.	...	...	38	32	-6

Budget Request

An appropriation of $3,033,000 and 22 positions is requested for 1980. This represents a decrease of $374,300 and two positions from 1979. This reduction in resources will come from research on oil shale and tar sands development.

Program Description

The fuel extraction program is designed to be responsive to the legislative mandates of the Clean Air Act, the Federal Water Pollution Control Act, the Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Toxic Substances Act as well as the Surface Mining Control and Reclamation Act of 1977. This responsiveness is encompassed in research and development activities directed toward the prevention, alleviation and abatement of all types of pollution caused by fuel extraction (oil, gas and coal) and related transportation activities. The major program areas include environmental assessments of problems related to Eastern surface mines, Eastern underground mines, treatment of mine drainage, Western coal mines, oil shale, uranium, transportation of fuels, solid waste from mining and oil spill control. Control techniques for advanced oil recovery are also included.

1978 Accomplishments

In 1978, obligations included $2,626,000 for contract support, $2,096,400 for grants and $398,500 for interagency agreements. The major emphasis of the 1978 program was placed on active mining, especially on newly emerging extractive efforts, while continuing minimum efforts on abandoned mines to keep abreast of the latest reclamation and restoration techniques. In addition, the assessment, development and demonstration of methods, equipment and techniques to control and cleanup spills of oil on land and water continued. Among the specific 1978 accomplishments were:

- Development of field-oriented manuals of practice on the environmentally acceptable techniques for the productive restoration of ocean estaurine inland and marsh shorelines impacted by oil spills.

- Evaluation of 20 oil spill control systems at the Oil and Hazardous Materials Simulated Environmental Test Tank.

- Development and delivery of an air jet boom designed to contain spilled oil in waters of up to 3-knot currents.

- Presentation of five workshops throughout the country to acquaint state and local planning officials with the methodology pertaining to the identification of the onshore impacts of OCS oil and gas development and the siting of onshore facilities associated with that development.

- Presentation of most recent developments to emergency response teams on oil spill debris disposal and on chemical dispersants for the control of oil spills.

- Development of a petroleum oil gelation technique utilizing amine reagent and carbon dioxide to facilitate the removal of oil spilled on inland water.

- Assessments of (1) the pollution potential of coal stock piles, (2) ground water pollution from eastern underground coal mines, (3) reclamation of spent oil shale and (4) impacts of surface mining on the Northern Great Plains.

- Publication of user manual for treatment methods of acid mine drainage and control methods for eastern surface coal mines.

- Demonstration of reclamation techniques on western coal mines.

1979 Program

The 1979 estimate is $3,407,300. These resources include approximately $957,500 for contracts, $1,126,600 for grants and $78,000 for interagency agreements.

During 1979 the extraction research program will complete assessments on control technology as well as instructional packages for inspectors and mine operators. It will further demonstrate the applications of technologies in the recovery programs at oil and gas production facilities and the onshore treatment of ballast waters. The 1979 program includes:

- Assessment of the pollution potential of enhanced oil and gas recovery techniques and development of strategies for minimizing the environmental impacts from these new extraction practices.

- Specification of operation and maintenance practices to reduce pollutant discharges from offshore oil and gas production facilities.

- Assessment of current capabilities for treatment of oil contamination spills and ballast water at shore reception facilities.

- Development of field manuals for utilizing chemical dispersing agents to control oil spills.

- Production of feasibility reports on the storing of waste underground.

- Providing the technical data base for establishing water pollutant discharge regulations for eastern and western coal mining operations.

- Development of prototype instructional package for training mine inspectors and operators in environmental control methods for coal mining.

1979 Explanation of Changes from Budget Estimates

The net increase of +$37,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

1980 Plan

The 1980 estimate is $3,033,000 and 22 positions. This represents a reduction of $374,300 and two positions from 1979. The reduction in resources will come from research on oil shale and tar sands development because these two emerging technologies are the furthest from commercial implementation. Of the $3,033,000 requested for 1980, approximately $870,000 is for contracts, $986,000 for grants and $77,000 for interagency agreements.

The 1980 plan for the fuel extraction research program is to assess, develop, identify, and verify control technology for solid fuel, oil and gas extraction which will assure that the recovery of the nation's fuel reserves is conducted in an environmentally acceptable manner. To this end, equipment, methods, and technology are assessed and developed to prevent, control, and abate the discharge of environmental pollutants from both point and nonpoint sources. Pollution sources include facilities for exploration, production, storage, and transportation of coal, uranium, oil shale, oil and gas. Both normal operations and accidental spills are examined.

Planned accomplishments for 1980 include:

- Continue efforts in environmental assessment of toxic pollutants, problem definition, and control technology development for the extraction, beneficiation and handling of energy resources, including coal, oil and natural gas. Work will be in support of program and agency needs, regional needs, and special requests from local, State, and Federal departments.

- Produce user manuals to summarize and describe previously verified environmental control and abatement procedures relating to coal extraction, beneficiation, and handling in the United States (both surface and underground operations).

- Develop techniques and systems for use by regional on-site coordinators for determining the extent of oil contamination and for directing spill cleanup and response efforts. Included will be field expedient measures for reducing spill impact. Federal, State and local government response personnel as well as their industry counterparts will use this information in responding to oil spills.

- Initiate new development in the area of shoreline protection and restoration following oil spills. Hardware and techniques will be used by Regional personnel responsible for oil spill cleanup and will assist them in developing decisions on the best available approaches for given spill circumstances.

- Continue assessment of available control technology in support of the Effluent Guidelines Division to ascertain the best available technology and develop data in support of the new source performance standards for offshore and onshore oil and gas production facilities. Levels of treatment will then be established based on realistic information relating to technology available to the oil and gas producing industries.

- Initiate development of guidelines for the installation and operation of oil/water separators to meet the best available technology and new source performance standards.

- Develop equipment and techniques to contain and control oil spills under cold climate conditions. A cold climate spill response capability (presently non-existent) is necessary to cope with the increasing number of oil spills occurring under cold weather conditions.

Research and Development

Environmental Impact of Conventional and Advanced Energy Systems

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs 1979
			(dollars in thousands)		
Appropriation	$17,407	$17,459	$17,228	$13,394	-$3,834
Permanent Position . . .	24	27	28	20	-8
Full-Time Equivalency . .	...	...	36	32	-4

Budget Request

An appropriation of $13,394,000 is requested for 1980, representing a decrease of $3,834,300 and eight positions from the 1979 level. This reduction in resources results from a decision to sharply curtail wastes-as-fuel technology development. This decision stemmed from RCRA regulatory requirements which led to a de-emphasis on resource recovery and an emphasis on waste disposal. In addition, DOE's program will take up some of the slack left by EPA's reduced efforts in this area.

This program includes environmental assessments of conventional combustion in electric utility and industrial power production, energy conservation, solar energy, and geothermal energy systems, and integrated technology assessment. The industrial and utility conventional combustion program emphasizes the characterization and quantification of the air, water, and land pollution potentials, the evaluation of environmental risk and the assessment of control techniques for criteria and noncriteria residuals. Major efforts are being directed toward the development of procedures for disposal of fly ash and flue gas desulfurization sludges. Integrated technology assessments provide an analysis of the environmental, economic, and social impacts of alternative energy supply and use scenarios on both local and regional levels. The conservation and advanced systems studies provide an assessment of the environmental and economic impact of energy conservation and of advanced energy systems, including solar, geothermal, and biomass systems. Environmental assessments are detailed characterizations of the air emissions, water effluents, and solid wastes released to the environment from energy sources, and anticipate the severity of associated environmental risks, provide preliminary targets for emission-limitation goals, and assess the ability of existing control methods to attain these goals. The program also contains limited efforts in pollution control development and evaluation.

1978 Accomplishments

As of 1978, obligations included $9,633,600 for contra ts, $4,657,400 for grants, and $1,403,700 for interagency agreements.

During 1978 results on regional impacts of increased energy development in the Western United States and the Ohio River Basin were completed, as were economic and environmental impact analyses for the revision of NSPS for utility boilers. Federal, State, and local laws and regulations that apply to geothermal energy development were categorized and analyzed as a continuation of the industry "guidance" strategy. The techniques available for the control of toxic effluents from utilities were assessed. The sources and ambient concentrations of polycyclic organic matter (POM) were reviewed and analyzed, and methods to protect health and welfare from the adverse effects of POM pollution were evaluated in support of Agency efforts mandated by Section 120 of the Clean Air Act. Construction of the first wastewater treatment plant to use both solar energy and methane recovery to provide energy for in-plant needs was completed.

1979 Program

The total resource allocation for the program is $17,228,300. Of this amount, $10,621,900 is for contracts, $2,858,000 is for grants and $1,734,000 is for interagency agreements. The allocation of 1979 funds in the environmental impacts of conventional and advanced energy systems program follows:

Waste Heat/Waste Products	$ 3,319,000
Conventional Combustion Environmental Assessment	4,709,200
Conservation and Advanced Systems	4,134,800
Integrated Technology Assessment	5,065,300
TOTAL	$ 17,228,300

1979 Explanation of Changes from Budget Estimate

The net decrease of -$230,700 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$67,200. A net increase of +$279,100 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of changes in Congressional appropriations affecting the exchange of functions with the Department of Energy, -$581,000 was reprogrammed within this activity to fuel processing, preparation, and advanced combustion. In addition, +$138,400 was reprogrammed within this activity from flue gas sulfur oxide control.

1980 Plan

The total resource allocation for this program is $13,394,000. Of this amount, $8,194,100 is planned for contracts, $2,224,100 is planned for grants, and $1,287,700 for interagency agreements. The allocation of the 1980 funds in the environmental impacts of conventional and advanced energy systems program is given below:

Waste Heat/Waste Product	$ 3,450,000
Conventional Combustion Environmental Assessment	3,374,000
Conservation and Advanced Systems	3,200,000
Integrated Technology Assessment	3,400,000
TOTAL	$ 13,394,000

Support for this program will be reduced by $3,834,300 and eight positions from 1979 levels. These reductions are brought about by shifting EPA priorities and by increasing complementary DOE efforts which somewhat offset the need for ongoing EPA efforts. The leading factors involved are: (1) the RCRA regulatory requirements which lead to a de-emphasis on resource recovery R&D and an increase in R&D to assure safe disposal of hazardous residuals generated by the energy industry, (2) the development of a strong energy conservation program at DOE, (3) the judgment that regional analytical studies of energy developments and conservation impacts are of lower priority in 1980, and (4) the judgment that after several years of emphasis a reduced level of effort is adequate to understand the environmental problems of conventional combustion.

As a result of these program priority realignments, "wastes-as-fuel" technology development efforts are being sharply curtailed. Wastes-as-fuel R&D will be largely limited to the highest priority problems identified by DOE. Efforts to identify the environmental threats posed by unregulated emissions from conventional combustion will also be limited. Analytical efforts to evaluate cross-media, regional, or national environmental impacts of and policy options for energy development and use will be limited.

To minimize the risk in these resource cutbacks leading to environmental problems from future energy developments, the EPA will increase its activities in assessing and overseeing DOE programs and will look to DOE to aid in identifying potential environmental concerns arising from conventional combustion, the use of waste and biomass as energy sources, solar energy systems, geothermal energy development, and energy conservation methods in industry and in buildings. R&D will be largely limited to emissions and control technology performance assessments. Alternative energy systems (solar and geothermal) and energy conservation-related environmental R&D will be limited to the highest priority problems identified by DOE and EPA. Efforts to identify the environmental threats posed by unregulated emissions from conventional combustion will also be limited.

Waste and Water

The overall objective of this activity is the identification, characterization, and assessment of liquid and solid effluents (including waste heat) from electricity generating facilities, and development, where appropriate, of control technology for the environmentally acceptable

ultimate disposal of these effluents. The efforts conducted as part of this activity are designed to identify potential environmental effects and to define and reduce the costs of power plant waste disposal options.

Primary emphases in this activity are focused on developing the data required to promulgate effluent guidelines required by the Federal Water Pollution Control Act and on providing the background information required to promulgate regulations required by the Resource Recovery and Conservation Act for the disposal of wastes generated by the utility industry.

1978 Accomplishments

The total allocation for this program area for 1978 was $2,565,600. Major accomplishments included:

- Demonstration of the use of utility condenser cooling water to provide heat to warm greenhouses for commercial crop production at a substantial savings in fuel oil consumption.

- Assessment of the technologies available for the control of toxic effluents from utilities. Four technologies were evaluated and the data is to be utilized in the promulgation of effluent guidelines.

- Initiation of an evaluation of lime precipitation as a means for treating boiler tube chemical cleaning wastes. This data is required to support the currently proposed 0.1 mg/liter standard for iron and copper.

- Initiation of studies on scrubber sludge dewatering and disposal techniques to determine the most environmentally acceptable disposal method which is economically achievable.

1979 Program

The total allocation for this program area for 1979 is $3,319,000. These funds will be utilized primarily to provide direct support to EPA regulatory program offices in the following two areas:

- Expanded regulatory support programs to obtain sufficient data and information to enable the promulgation of guidelines or regulations for the storage, treatment, and disposal of coal ash and flue gas desulfurization scrubber waste from coal-fired steam electric generators.

- Regulatory support efforts to provide the data required for the promulgation and implementation of effluent guidelines for the utility industry.

1980 Plan

The total request for this program area in 1980 is $3,450,000. These funds will be utilized to complete the acquisition of the data required to promulgate the regulations for liquid and solid waste from coal-fired steam-electric generators. The following information will be provided:

- A characterization of fly ash alone and fly ash/sludge mixed to determine if different disposal techniques are required for each of the two situations.

- An examination of disposal techniques for fly ash only and fly ash/sludge disposal to identify private industry practices.

- An evaluation of the effects of promising disposal techniques on ground water and surface waters.

- An evaluation of the costs of promising fly ash/sludge disposal techniques and of the economic impacts of these on the utility industry.

Conventional Combustion Environmental Assessment

The objective of this program is the comprehensive assessment of the environmental, economic, and energy impacts of multimedia emissions of pollutants from stationary industrial, utility, residential, and commercial conventional combustion processes. Primary emphases of the program are identifying and evaluating (1) the relationships between various emissions and residuals from conventional combustion, (2) multi-pollutant synergistic impacts, (3) cross-media impacts, (4) environmental impact tradeoff as relative emission levels of individual pollutants are adjusted by control systems, and (5) unregulated pollutant emissions, impacts, and control methods. The program seeks to integrate information and data from previously separate environmental efforts (e.g., the SO_X, NO_X, etc. R&D programs) into a systematic, coordinated, environmental assessment structure.

1978 Accomplishments

The total allocation for this new program area for 1978 was $3,170,000. Major outputs included initial program definition and organization, as well as the following:

- The comprehensive environmental assessment of a 10MW industrial boiler conducted by the CCEA program indicates that the National Energy Plan objective of extensive conversion of oil to coal can be accomplished without unacceptable environmental degradation. The assessment concludes that the difference in environmental insult resulting from coal and oil emissions is insignificant if appropriate control technologies are carefully applied.

- A draft report on the sources of emissions of POMs and on protecting health and welfare from the injurious effects of POMs was issued to support Agency reviews mandated by Section 120 of the Clean Air Act. The report includes a review and analysis of the sources and ambient concentrations of POMs.

- A national survey of conventional combustion process data sources was completed.

- A draft report was issued containing a comprehensive emissions assessment of electricity generation and industrial internal combustion sources.

- A draft report was issued containing the most comprehensive emissions assessment ever compiled of gas-fired and oil-fired residential heating systems.

- A report was issued providing a comprehensive emissions assessment of residential coal combustion.

- A special study was completed characterizing the emissions of stationary NO_x sources with an emphasis on unregulated pollutants. The study evaluates methods to modify combustion conditions to minimize NO_x emissions.

1979 Program

The total allocation for this program in 1979 is $4,709,200. The program plans include:

- Defining emission rates of unregulated pollutants from some major conventional combustion sources.

- Continuing a major emissions characterization program of conventional combustion processes (150 sites), ranging from residential burners to large utility boilers.

- Continuing the comparative environmental assessment of oil and coal firing in (controlled) utility and industrial boilers.

- Undertaking a special series of studies on high priority issues, including:

  . Defining the carcinogenic potential of emissions from residential oil-fired boilers.

  . Defining the potential environmental threat posed by heavy metals from coal-fired combustion sources.

  . Defining the carcinogenic potential of emissions from industrial and residential wood burning.

1980 Program

The total allocation for this program in 1980 is $3,344,000. Major planned activities include:

- Assembly and evaluation of the emissions data base (multi-media, with an emphasis on unregulated pollutants) from major categories of stationary conventional combustion processes.

- Completion of the major emissions characterization program of conventional combustion processes begun in 1978.

- Completion of source emission assessment and bioassay studies of industrial internal and external combustion processes. These studies will contribute to Agency development of the industrial boiler NSPS.

- Completion of annual update assessing, by conventional combustion processes, emission rates of unregulated pollutants (including cadmium, arsenic, POM and sulfates).

Energy Conservation Methods and Advanced Energy Systems

The general objectives of this program are to develop environmental assessments of energy conservation methods and advanced energy systems and to contribute to the development of pollution control technologies for resource recovery, energy-conserving industrial processes, advanced energy conversion cycles, and advanced energy systems--solar and geothermal energy. Techniques and technologies are under development by the Department of Energy, the Department of Housing and Urban Development, and other agencies in these areas, and by the EPA in the resource recovery area. Outputs will support two interagency working groups--the Interagency Task Force on Energy Conservation in Buildings and the Interagency Task Force on Energy Conservation in Industry, as well as EPA regulatory responsibilities, by assuring the environmental compatibility of techniques and technologies in each subject energy area.

1978 Accomplishments

The total allocation for this program area in 1978 was $7,050,000. The major 1978 accomplishments include the following:

- Performed economic, technical, and environmental evaluations of eight resource recovery systems, refuse-derived fuel processing, and energy recovery equipment and systems. These evaluations assess the potential for successful, environmentally-compatible implementation of the numerous systems being developed by EPA, DOE, and private industry.

- Identified and characterized various waste streams emitted and residual pollutants produced in several resource recovery and energy conservation processes.

- Continued development of a system for cofiring densified refuse-derived fuel with coal in industrial and utility boilers.

- Developed final designs and operational criteria with the State of California for a mobile pyrolysis demonstration unit capable of converting agricultural wastes to useful char and fuel oil.

- Completed construction (using wastewater construction grant resources) of the first facility to use both solar energy and methane recovery to provide in-plant energy (70%-80% self-sufficiency projected).

- Completed a catalogue and analysis of Federal, State and local laws and regulations that apply to geothermal energy development.

1979 Program

The total allocation for this program area in 1979 is $4,134,800. The major 1979 planned activities include:

- Completion of the industrial waste heat utilization studies.

- Performance of limited technology development studies of the two most promising wastes-as-fuel systems.

- Provision of data to the Office of Solid Waste for the special studies required by the Resource Conservation and Recovery Act.

- Continued limited development of the densified refuse-derived fuel for industrial-sized boilers process and construction of the mobile agricultural and forestry waste pyrolyzer.

- Continued assessments of key potential geothermal and solar energy environmental problems.

- Completed a study of the environmental issues associated with co-generation of electric power and district heating.

- Completed an assessment of the impact of high implementation rates of energy conservation and solar energy on ambient air quality in specific air quality control regions.

- Evaluated hydrogen sulfide emission control devices for geothermal energy production sites.

- Completed preliminary evaluation of the first solar-assisted waste-water treatment plant.

1980 Plan

The total request for this program area in 1980 is $3,200,000. The major work areas for this reduced program planned in 1980 include:

- Performance of environmental assessments of two wastes-as-fuel systems that are presently in advanced states of development.

- Continuance of limited technology studies and environmental testing of the densified refuse-derived fuel system and the mobile waste pyrolysis system.

- Continuation of limited assessment and control technology evaluation research for geothermal air and groundwater emission problems.

- Preparation of initial industry guidance studies for solar energy systems entering the commercialization stage.

Integrated Technology Assessment

The overall objective of the integrated technology assessment (ITA) program is to identify environmentally, socially, and economically acceptable alternatives for meeting national energy objectives, and to assist in the selection of "optimum" policies for the attainment of associated environmental quality goals. This objective will be met by:

- Performing studies to evaluate the cost/risk/benefit trade-offs of energy production and pollution control alternatives.

- Conducting technology assessments which evaluate alternative energy technologies and approaches for implementing energy development, preventing environmental damage, and securing related benefits.

- Identifying gaps in present research programs and indicating new priority research topics which must be addressed in order to support direct Agency responsibilities.

1978 Accomplishments

The total allocation for this program area in 1978 was $4,621,000. Accomplishments included:

- Completion of regional and national economic environmental impact analyses contributing to the Agency's revison of NSPS for utility boilers.

- Completion of comprehensive review of existing air quality models and initiation of development of a specialized model for regional air quality.

- Issuance of Phase I report from the Ohio River Basin Energy Study (ORBES). Phase I provides tentative identification of potential environmental, social, and economic impacts that might result from varying levels of electric energy facility development in the Ohio River Basin.

- Completion of further analyses of the economic impacts of the development of western energy sources, including identification of industries whose growth rates and pollutant residuals levels would be significantly stimulated by regional energy development, and of some interactions between proposed environmental regulations and the prospects for economic growth in the western region.

1979 Program

The total allocation for this program in 1979 is $5,065,300. In 1979, the integrated technology assessment of western energy development will be completed. In addition, the program plans include:

- Performing Congressionally-mandated analyses of the environmental and energy conservation aspects of Federal non-nuclear research programs and preparing a report to the Congress on the findings.

- Studying the consumptive water use in power plant cooling in the western United States and assessing opportunities for energy-associated water conservation in the western region.

- Completing the Ohio River Basin Energy Study defining the social, economic, environmental, institutional and public health impacts of energy development in the Ohio River Basin.

- Publishing interim reports describing significant early results of the technology assessment of the electric utility industry.

- Completing the 1979 Report to Congress--The Environmental Outlook--analyzing trends and sources of pollution from major source categories.

1980 Plan

The total request for this program area in 1980 is $3,400,000. The program will include:

- Extending the regional integrated technology assessments (ITA) of the Ohio River Basin and Appalachia to identify energy-development policy options for local, State, and/or regional governments.

- Extending the coal technology, electric utility, coal development and oil shale development ITAs to evaluate impacts of new conversion technologies and deployment strategies on residuals disposal, toxic and trace elements levels, and water use.

- Performing analyses of Federal non-nuclear energy research programs, and publishing the annual Report to Congress based on the findings of the analyses.

- Assessing, through ITA mechanism, industrial pollution control options, with an emphasis on inter-industry interactions, cumulative pollution, and opportunities for area-wide treatment and recycling.

ENERGY

Research and Development

Flue Gas Sulfur Oxide Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation	$11,604	$2,099	$3,181	$1,889	-$1,292
Permanent Positions	10	6	5	5	...
Full-Time Equivalency ..	...	...	7	8	+1

Budget Request

An appropriation of $1,889,000 and five positions is requested for 1980, representing a decrease of $1,292,800 from the 1979 level. The reduction in resources results from completion in 1979 of full-scale testing of adipic acid/limestone flue gas desulfurization.

Program Description

This program includes sulfur oxide pollution control research and development relating to electric utility and industrial power generation. Major efforts are directed towards flue gas desulfurization (FGD) technology development and assessment; assessment of the capital and operating costs of FGD systems; research and development directed towards increasing FGD system reliability and reducing sulfur oxide emission levels with little or no cost impact; and transferring the technological innovations to the public sector.

1978 Accomplishments

As of September 30, 1978, obligations included $5,423,800 for contracts, $601,000 for grants, and $5,387,000 for interagency agreements. The following were accomplished:

- Demonstrated successful, long-term operation of the Wellman-Lord/Allied Chemical FGD process at a 115 MW electrical generating facility of Northern Indiana Public Service Company. The system reduced the sulfur oxide emissions by 90 percent and produced elemental sulfur as a by-product.

- Demonstrated the effectiveness of adipic acid as an additive to enhance the sulfur oxide removal capabilities and reliability of lime/limestone FGD systems.

- Completed an assessment of FGD systems applied to utility and industrial boilers in Japan.

- Assessed various FGD technologies with regard to their applicability to industrial boilers. This assessment will form the basis of a potential New Source Performance Standard (NSPS) for Industrial Boilers.

1979 Program

The total resource allocation for the program is $3,180,800. Of this amount, $2,394,000 is for contracts, $50,000 is for grants, and $400,000 is for interagency agreements.

The 1979 program will initiate the evaluation of two recent breakthroughs in flue gas desulfurization technology. These breakthroughs include dry SO_2 control and adipic acid modified limestone wet scrubbing . Both of these technologies offer the potential for increased SO_2 removal, increased reliability, and reduced operating and capital costs. Additional planned accomplishments include:

- Demonstrate at full scale (for two months) adipic acid modified limestone FGD at the Tennessee Valley Authority's Widows Creek No. 8 boiler and Kansas City Power and Light's LaCygne No. 1 boiler.

- Initiate compliance tests and the long-term test program at the dual alkali FGD installation at Louisville Gas and Electric's Cane Run No. 5 boiler.

- Conduct the Fourth International Symposium on Flue Gas Desulfurization.

- Initiate a coordinated program to evaluate the applicability of dry sulfur oxide control processes on high and low sulfur coal.

- Complete the final year of the Wellman-Lord/Allied process evaluation at Northern Indiana Public Service Company's Mitchell Station.

1979 Explanation of Changes From Budget Estimate

The net increase of +$1,081,800 results from several actions. A net increase of +$17,800 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of congressional changes to appropriations affecting the exchange of functions with the Department of Energy, +$1,258,000 was reprogrammed within this activity from nitrogen oxide control. In addition, -$194,000 was reprogrammed within this activity, $138,400 to environmental assessment of conventional and advanced energy systems and $55,600 to effects of energy related pollutants on organisms and ecosystems.

1980 Plan

The total resources planned for this program are $1,889,000. This represents a decrease of $1,291,800 from the 1979 level. The reduction in resources results from completion in 1979 of full-scale testing of adipic acid/limestone flue gas desulfurization. Of the $1,889,000 requested for 1980, $1,310,400 is planned for contracts, $31,200 is planned for grants, and $218,400 is planned for interagency agreements. The 1980 program is intended to complete the evaluation of the dual alkali process; to continue the dry SO_2 control; and to maintain the technology transfer efforts included in previous fiscal years. Other planned accomplishments include:

- Complete the dual alkali evaluation program at Louisville Gas and Electric. The final report will provide an evaluation of performance and economic factors; this technology offers potential for cost and reliability advantages over commercial lime and limestone FGD systems.

- Document the full scale evaluation of the adipic acid modified limestone FGD process evaluation. Special attention will be given to the economic impacts of this process modification and any secondary operational or environmental factors.

- Continue to issue quarterly updates of the performance and status of existing FGD systems for new FGD installations.

- Complete the preliminary evaluation of dry sulfur oxide control processes. Such processes offer the promise for low cost energy-efficient alternatives to commercial FGD systems.

ENERGY

Research and Development

Nitrogen Oxide Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation.....	$21,275	$14,850	$13,528	$13,815	+$287
Permanent Positions....	20	23	23	23	...
Full-time Equivalency..	...	...	33	35	+2

Budget Request

An appropriation of $13,815,000 is requested for 1980 representing an increase of $287,200 from the 1979 level. The increased resources will be used to accelerate the low NO_x coal burner program.

Program Description

This program includes nitrogen oxide pollution control research and development relating to emissions of nitrogen oxide from electric utility boilers, industrial boilers, process furnaces, and other stationary sources. Successful conduct of such a program is important since NO_x emissions from stationary sources are projected to increase at an alarming rate over the next two decades. This is primarily due to the projected increased combustion of coal and the current absence of cost effective NO_x control technology. The program focuses upon two major nitrogen oxide control technologies: combustion modification and flue gas treatment. The combustion modification program is divided into technology development and technology application. The smaller flue gas treatment sub-program maintains an awareness of Japanese NO_x control technology developments and involves pilot scale testing of promising concepts.

1978 Accomplishments

The total allocation for this program in 1978 was $21,274,700. As of September 30, 1978, extramural obligations included $18,331,100 in contracts, $2,032,000 in grants, and $349,800 in interagency agreements. The program to develop and demonstrate a low NO_x burner has made significant progress; a utility boiler scale burner has been evaluated and the NO_x emissions were about 0.2 pounds per million BTU which can be compared to the current emission limit of 0.7 pounds Construction of the two pilot scale flue gas treatment facilities is nearing completion.

- Demonstrated a low NO_x, fuel efficient residential oil furnace. This furnace increases fuel efficiency by about 20 percent while simultaneously decreasing NO_x emissions by 65 percent.

- Demonstrated on a 100 million BTU per hour low NO_x coal burner a 0.2 pounds NO_x per million BTU emission rate. This emission rate can be compared to the current emission rate of 0.7 pounds of NO_x per million BTU.

- Initiated the survey to identify host utility and industrial sites to demonstrate the low NO_x coal burner.

Demonstrated at prototype scale a fuel efficient, low NO_x combustion chamber for stationary gas turbine engines.

- Completed construction of the pilot scale flue gas treatment facilities on two coal fired boilers. The first unit controls only NO_x and is designed to achieve a 90 percent NO_x reduction. The second unit reduces the emissions of both NO_x and SO_x, each by 90 percent.

- Provided technical data and assistance to the Office of Air Quality Planning and Standards to help establish new emission limits for industrial boilers.

- Completed the corrosion test program at a boiler which could comply with the 0.7 pounds of NO_x per million BTU regulation.

1979 Program

The total resource allocation for the program is $13,527,800. Of this amount, $11,213,800 is for contracts: $290,000 is for grants; and $272,000 is for inter-agency agreements. The 1979 program will continue the evaluation and demonstration of the low NO_x coal burner utility and industrial host sites. Program activities and planned accomplishments include:

- Demonstrate the NO_x emission levels which are achievable using multiple low NO_x burner arrays to simulate a utility boiler application.

- Select the host sites and begin engineering design for the demonstration of the low NO_x coal burner.

- Complete the test program at the flue gas treatment facilities to determine the cost of achieving 90 percent NO_x reduction.

- Work with the California Air Resources Board to determine how EPA's expertise can be used to aid industry to comply with California's recently proposed NO_x regulations.

- Initiate the evaluation of combustion modification concepts to reduce NO_x emissions from stationary internal combustion engines.

- Complete the field monitoring program to collect data to support the Office of Air Quality Planning and Standards industrial boiler rule-making efforts.

- Initiate efforts to develop low NO_x burners for residual oil and synthetic liquid fuels from coal and shale.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,322,200 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$100,000. A net increase of +$35,800 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of congressional changes to appropriations affecting the exchange of functions with the Department of Energy, -$1,258,000 was reprogrammed with this activity to flue gas sulfur oxide control.

1980 Plan

The total request for this program area in 1980 is $13,815,000. This represents an increase of $287,200 from the 1979 level. The increased resources will be used to accelerate the low NO_x burner program. Of the $13,815,000 requested for 1980, $11,682,000 is planned for contracts, $368,900 is planned for grants and $245,900 is planned for interagency agreements.

The major activities planned for 1980 are to continue the development and demonstration of the low NO_x coal burner, continue field testing of combustion modification concepts, and development of energy efficient NO_x control concepts for stationary internal combustion engines and stationary gas turbines. In addition, the following are planned:

- Demonstrate the low NO_x coal burner on an industrial boiler and on a utility boiler. The program goal is an emission rate of 0.2 pounds of NO_x per million BTU.

- Evaluate dry NO_x control technology for stationary, high efficiency gas turbines to support the Congressionally-mandated review of the New Source Performance Standard for Gas Turbines.

- Demonstrate combustion modification concepts to simultaneously reduce NO_x and particulate emissions from stationary internal combustion engines.

- Conduct assessment and applications testing of combustion modification technology for stoker coal-fired commercial and industrial boilers.

- Document the status of NO_x control for utility boilers to support the 1982 review of the Utility Boiler Standard of Performance for NO_x, as required by the Clean Air Act Amendments of 1977.

- Continue bench-scale research and assistance to California on the technical and economic factors relating to flue gas treatment for NO_x and simultaneous NO_x/SO_x control.

Research and Development

Flue Gas Particulate Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase+ Decrease- 1980 vs 1979
			(dollars in thousands)		
Appropriation	$14,183*	$9,889*	$8,863	$8,000	-$863
Permanent Positions . .	15	17	15	13	-2
Full-Time Equivalency .	...	...	2	2	

Budget Request

An appropriation of $8,000,000 is requested for 1980. This represents a decrease of $863,300 and two positions from the 1979 level. This reduction will come from research on dry SO_x removal by baghouse filters.

Program Description

The goals of this program are to assess and develop technological methods for the control of all forms of man-made (and induced) emissions of particulate matter, particularly those that affect human health and welfare.

The objectives of the program are to:

- Assess and improve the effectiveness of conventional particulate control technology to meet existing and proposed particulate emission regulations.
- Assure that technology is available to permit increased use of low sulfur western coals such that particulate emissions can be controlled within existing and proposed standards.
- Develop and evaluate new inhalable particulate matter control technology for stationary and fugitive emission sources.
- Assess and develop control of particulate emissions from mobile diesel engines to support the Agency mandate to set a best available technology standard by 1981.

1978 Accomplishments

The total allocation for this program in 1978 was $14,183,100. As of September 30, 1978, extramural obligations included $11,747,000 in contracts, $1,363,100 for grants, and $99,800 for interagency agreements.

- Developed an assessment of control technology for industrial fugitive particulate emissions to support the Agency decision to set an inhalable particulate standard.

- Provided Standards Revision Working Group data on particulate control capabilities of scrubbers for formulating revised utility boilers New Source Performance Standards (NSPS).

- Developed state-of-the-art on flue gas conditioning to support justification for implementing interim particulate standards compliance for utility boilers switching to low sulfur coal (LSC).

- Provided technical support for Agency's efforts aimed at setting an NSPS for industrial boilers.

- Initiated the program for mobile diesel particulate emission control to support the Agency mandate to establish a 1981 emission standards.

- Completed (US/USSR) bilateral agreement obligation for developing and hosting a joint symposium on electrostatic precipitator (ESP) and scrubber technology. Conducted a fabric filter symposium and established the first international conference on all aspects of particulate control technology, measurement, effects and standards.

- Established new version of ESP Model. Both ESP and Scrubber models reduced for use on programmable calculators. Revised fabric filter model for easier use by regional personnel, industry and TVA.

- Demonstrated baghouse filter for a 350 MW power plant burning low sulfur coal in full operation. Initiated pilot scale test of SO_x removal by an industrial boiler baghouse.

- Achieved successful pilot test for removing steel plant sinter operations dusts using a new high gradient magnetic separator device.

- Achieved successful bench scale verification on cleaning high temperature-pressure gases using ceramic bag filters and dry particle scrubbers.

1979 Program

The 1979 estimate is $8,863,300. These resources include approximately $5,936,000 for contracts, $680,800 for grants and $1,300,000 for interagency agreements. The 1979 program will initiate a major expansion to quantify inhalable particulate matter emission sources to support the Agency strategy to establish guides to the States, or national standards for the control of inhalable particulate matter in the early 1980's. Additionally, program activities and planned accomplishments are to:

- Complete Phase I evaluation of baghouse usage on large low sulfur coal utility boiler, including issuing a final report on pulse-jet modifications for improved baghouse performance. This technology is expected to find greater application for low sulfur coal burning utilities.

- Conduct applications workshop for particulate control devices, with emphasis on the uses of a validated fabric filter (baghouse) model.

- Conduct field evaluations of flue gas conditioning agents for compliance with emission regulations. This effort is to assure and monitor the prospective Agency directive requiring conditioning as a method of interim compliance with particulate standards.

- Complete lab and field evaluation of improved ESP (precharger) for high resistivity fly ash. Development of an ESP precharger will complement and/or obviate the need to condition flue gases by the use of chemical additives.

- Continue development of the fine particulate emissions information system (FPEIS). This program provides the initial data base for the quantification of the inhalable particulate matter emission sources.

- Evaluate particulate control performance for boilers using low sulfur coal and a laboratory evaluation of ESP performance when using cleaned coals.

- Continue conventional technology assessments to support 1982 revisions to NSPS for utility boilers. Issue compliance NSPS support document for industrial boilers.

- Complete initial assessment of urban fugitive particulate emissions, including a review of applicable technologies for fugitive emissions, and a bench evaluation of the charged fogger for fugitive dust control.

- Report on potential of high temperature/high pressure control technologies to meet NSPS for combined cycle power plants. This will include bench testing integrated systems for dry gas scrubbing and hot gas filtration.

- Complete diesel emission characterization and identifying potential after treatment control devices and initiate mobile evaluation of after-treatment particulate trapping devices for diesel emission control. This effort is directed to meet the requirement for setting a standard for particulate emissions from mobile sources as indicated in the 1977 Amendments to the Clean Air Act.

1979 Explanation of Changes From Budget Estimates

The net decrease of -$1,025,700 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$60,000. A net increase of +$53,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. In addition, as a result of the agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan, -$1,019,000 was reprogrammed from this activity to scientific assessment ($848,600) and technical information ($170,400) within the interdisciplinary medium.

1980 Plan

For 1980, the total allocation for this program is $8,000,000. This represents a decrease of $863,300 and two positions from the 1979 level. This reduction will come from research on dry SO_x removal by baghouse filters because the DOE will be increasing its resource allocation in this area. Of the $8,000,000 requested for 1980, $5,337,600 is planned for contracts, $640,500 for grants and $1,138,700 for interagency agreements. During 1980 the Stationary Sources Standards support will continue with a major effort to develop inhalable particulate matter emission factors for important sources as requested by the Air Program Office. In addition, efforts in diesel standards setting support, expanded coal usage, and fundamental supporting research programs will continue. In 1980 this program's objectives are to:

- Characterize inhalable particulate matter emissions from important sources. Such information will be required to allow selection of the appropriate control technology to achieve a possible ambient inhalable particulate matter (fine) particulate standard. Such a revised ambient standard is under active evaluation by EPA.

- Review utility boiler particulate control technology adequacy in order to help the Air Program Office evaluate the appropriateness of revising the NSPS in 1982.

- Initiate evaluation of optimized (SO_x - Particulates) mini-plant wet scrubber with the objective of achieving the proposed 1982 NSPS for particulates and SO_x with a single control device.

- Continue assessment and development of flue gas conditioning additives and the engineering evaluation of a 30,000 SCFM electrostatic precipitator (ESP) precharger for enhanced particulate control. Subsequently, perform evaluation of control enhancement options for low sulfur coal boilers with low performance ESPs.

- Complete the initial mobile evaluation of after-treatment particulate trapping devices for diesel emission control, and assess the prospect of their use to support a mobile emission standard.

- Continue technology transfer efforts in the inhalable particulate matter control area, including the sponsorship of conferences and issuance of technical reports.

- Complete evaluation of a full scale baghouse on low sulfur coal utility boilers, and continue assessment of electrostatic enhancement of fabric filtration for baghouse applications. Baghouses represent the most cost-effective control alternative for stringent particulate emission limitations particularly for low sulfur coal applications where ESPs are costly.

Research and Development

Effects of Energy-Related Pollutants on Organisms and Ecosystems

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation	$11,200	$15,844	$16,078	$14,648	-$1,430
Permanent Positions ...	2	2	3	3	...
Full-time Equivalency .	...	...	17	16	-1

Budget Request

An appropriation of $14,648,000 and three positions is requested for 1980. This represents a $1,429,800 decrease from the 1979 level and will come from research on the long-term effects of hydrocarbons, biological indices for fresh water ecosystems, and trace contaminant effects.

Program Description

This program has the overall goal of assessing the environmental effects of present and proposed energy development activities on fresh surface and groundwater, marine and estuarine, and atmospheric/terrestrial ecosystems. The program includes research on (1) the nature and effects of energy-related pollutants resulting from extraction of raw fuels on the terrestrial ecosystem; (2) the determination of background contamination levels in both the marine and estuarine environments resulting from oil and gas drilling operations; and (3) the accumulation of baseline information needed to predict the impacts of heat on the freshwater ecosystems of lakes, rivers, and ponds.

1978 Accomplishments

Program obligations for 1978 included $6,966,900 for interagency agreements; $18,600 for contracts; and $2,741,700 for grants. The accomplishments for 1978 include the following:

- A sequence of toxicity tests were developed to assess the ecosystem effects of pollutants that result from oil and gas exploration and extraction in the Gulf of Mexico.
- Studies on the chemical and biological effects from coal extraction at Colorado sites on aquatic ecosystems were completed.
- Thermal effects evaluation on marine organisms, stressing response to coexposures to heat and metals was completed.

- Analyses of halogenated organic compounds from power plant effluents in a low salinity estuary were completed.

- Experiments on plants, including fast-growing trees, to assess growth support capabilities of specific land reclamation sites in relation to water quality and soil characteristics were completed.

- A laboratory was developed on an offshore research platform to compare effects of drilling fluids observed on estuarine organisms with the effects on organisms from the open ocean.

1979 Program

The estimated 1979 allocation for this program is $16,077,800. Of these resources $11,038,000 are for interagency agreements; $100,000 are for contracts; and $3,636,500 are for grants. Program activities and planned accomplishments for 1979 include:

- Identification of compounds found in marine and estuarine waters as a result of chlorination.

- Investigation of toxicity and bioaccumulation of polynuclear aromatic hydrocarbons (PAH's) in freshwater animals.

- Publication of a state-of-the-art report on cooling water intake structures and their effects on aquatic organisms.

- Determination of the toxicity of metals and hydrocarbons to marine organisms.

- Development of methods to evaluate the effects of petroleum-derived diesel fuel on marine organisms.

- Completion of the environmental impact studies of coal-fired power plants at Colstrip, Montana; the environmental assessment of Northern Puget Sound and Gulf of Mexico; the ecological analysis of effects on natural oil seeps in Santa Barbara channel; and the coastal ecosystem characterization studies.

- Determination of which halogenated organics are formed as a result of ozonation and chlorination.

- Initiation of studies on the formation of bromoform and its transfer in the marine food web.

- Initiation of study on the environmental effects of increased commercialization of groundwater heat pumps in semiarid regions of the Western United States.

1979 Explanation of Changes from Budget Estimate

The net increase of +$233,800 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was $28,900. A net increase of +$10,700 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of congressional changes to appropriations affecting the exchange of functions with the Department of Energy, -$174,000 was reprogrammed within this activity to transport and fate of energy related pollutants. In addition, +$426,000 was reprogrammed within this activity from flue gas sulfur oxide control ($55,600) and transport and fate of energy related pollutants ($370,400).

1980 Plan

The total allocation for this program for 1980 is $14,648,000. This represents a $1,429,800 decrease from the 1979 level. A number of projects in the Federal Interagency Energy/Environment R&D Program terminate in 1979. These terminations (decreases) include research on the long-term effects of hydrocarbons, biological indices for freshwater ecosystems, and trace contaminant effects. Of the $14,648,000 requested for 1980, $10,012,000 are for interagency agreements; $90,300 are for contracts; and $3,247,100 are for grants. Planned activities for 1980 include the following:

- The Marine Environmental Research Facility of the University of Rhode Island will be used for ecological effects studies of "consent decree" pollutants.

- Studies will be initiated at the Texas Flower Gardens (living coral reef area offshore) that will emphasize the fate and effects of drilling fluids and cuttings in the study area. The results of these experiments will be used in EPA Region 6 policy decisions regarding the discharge of drilling fluids adjacent to coral reefs.

- Studies will be initiated near Georges Bank (New England area) to determine the effects of drilling fluids on marine community structure and function. Potential effects on the American lobster will also be evaluated. The results of these experiments will be used as the basis for EPA Region 1 policy decision on the disposal of drilling fluids in the Georges Bank area.

- The USDA acid rain monitoring network will be augmented to cover additional geographic areas throughout the midwestern farm belt.

- Interagency (EPA, DOE, and HEW) workshops to define the state-of-the-art relative to the health and environmental impacts of advanced energy technologies will be conducted.

- Multi-media environmental impact studies of coal-fired power plants in the northcentral states will be completed.

- Studies on the marine effects of biocides used in cooling systems will be continued.

ENERGY

Research and Development

Transport and Fate of Energy-Related Pollutants

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation	$4,528	$9,110	$8,811	$7,614	-$1,197
Permanent Positions . .	2	1	3	3	...
Full-time Equivalency .	...	...	8	7	-1

Budget Request

An appropriation of $7,614,000 is requested for 1980. This represents a decrease of $1,196,700 from the 1979 level. This decrease will come from development of transport and fate studies of secondary pollutants by means of novel remote sensing techniques.

Program Description

The goals of this program are to characterize, assess and develop predictive models of the transmission of energy-related pollutants in air, water and soil; their transformation enroute into secondary pollutants; and their ultimate sink and impact on man and the environment. The objectives of the program are to determine the sources and characterize energy-related pollutants, including emissions into the air from coal-, oil-, and gas-fired power plants; emissions of pollutants into the air and water from advanced energy technology development, such as coal liquefaction and gasification, oil shale extraction, and geothermal energy exploitation; effluents and leachate reaching ground-, stream-, and ocean-waters from power plant processes, including solid waste disposal; and thermal pollution of air and water. Also included is the determination of the transformation of above-mentioned primary source pollutants into secondary pollutants by means of their interaction with entrained ambient air, water vapor, rain and ice, and solar irradiation.

1978 Accomplishments

Program obligations for 1978 included $1,239,600 for interagency agreements; $1,839,100 for contracts; and $1,179,500 for grants. Among the 1978 accomplishments are the following:

- The atmospheric transport and transformation was determined for sulfur oxide from coal-fired power plants in the Tennessee Valley. The emphasis was on conversion of SO_2 to sulfate fine particulates in single plumes on the multi-hundred kilometer scale under various weather conditions, including stagnation periods.

- Project VISTTA (Visibility and Interstate Sulfur Transformation and Transport in the Atmosphere) was initiated. The project concentrates on the western energy development region to determine the impact of regional visibility from long-range transport and transformation of single plumes and aggregate regional power plant related pollution on regional weather systems. The 1978 summer field studies results were analyzed and published.

- Field studies were initiated to assess the levels and distribution in the atmosphere of the organic fraction of secondary fine particulates due to coal-fired power plants in the Ohio River Basin.

- A study was initiated on advanced fuel technology pollutant assessment. This study encompasses the characterization, transport and fate, of pollutants from technologies such as (a) atmospheric fluidized bed combustion; (b) oil shale extraction techniques, and (c) coal gasification.

- The Power Plant Scrubber Secondary Pollutant Study was initiated. This study assesses the transport and transformation of secondary fine particulates, sulfates, and nitric acid aerosols from conventional power plants equipped with SO_2 scrubbers and particle removal devices.

- The mechanism and rate of formation was investigated for inorganic compounds formed from leaching of strip mines and their solid waste; the mechanisms by which these contaminants enter and are transported in waterways, and mathematical models were developed to predict water quality in streams in coal mine areas.

1979 Program

The estimated 1979 allocation for this program is $8,810,700. Of these resources, $4,457,000 are for interagency agreements; $2,609,000 are for contracts; and $1,365,000 are for grants.

In 1979 we expect intensification of the regional Transport, Transformation and Fate (TTF) programs designed to determine the environmental impact of existing and planned energy activities in various regions of the United States, especially the Ohio Valley, the Tennessee Valley, the Northeastern States, and the western energy development region. The program will obtain a significant impetus by the addition of the Multistate Atmospheric Power Production Pollution Study (MAP3S) which DOE initiated and transferred to EPA in 1979. In 1979 this program will:

- Investigate the sulfate fine particulate formation resulting from power plants in the Western U.S. and the relationship of sulfate particulates to the visibility degradation. This is a continuation of Project VISTTA.

- Investigate the formation of nitrate and organic fine particle formation process and transport in plumes from Ohio Valley power plants.

- Continue the studies (both laboratory and field) on the determination of pollutant sources, transport, transformation and fate from advanced fuel technology, such as fluidized bed combustion, pollution control technology-equipped power plants, coal liquefaction and gasification.

- A master analytical scheme is being developed for the simultaneous identification and quantification of all volatile organic compounds likely to be encountered in waste streams from energy sources.

- Develop quality assurance procedures for pollutant measurements in the marine environment.

- Develop predictive model for coastal oil spills.

- Monitor circulation in Strait of Juan De Fuca in support of the Puget Sound oil transport environmental assessment.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$299,300 results from several actions. A net increase of +$10,700 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of congressional changes to appropriations affecting the exchange of functions with the Department of Energy, +$157,200 was reprogrammed within this activity from health effects of energy related pollutants ($80,000) and measurement systems and instrumentation development for energy related pollutants ($77,200). In addition, -$196,400 was reprogrammed within this activity to effects of energy related pollutants on organisms and ecosystems, and -$270,800 was reprogrammed to scientific assessment within the interdisciplinary medium.

1980 Plan

The total allocation for this program for 1980 is $7,614,000. This represents a decrease of $1,196,700 from the 1979 level. A number of projects in the Federal Interagency Energy/Environment R&D Program terminate in 1979. These terminations (decreases) include development of transport and fate studies of secondary pollutants by means of novel remote sensing techniques. Of the $7,614,000 requested for 1980, $3,836,700 are for interagency agreements; $2,244,100 are for contracts; and $1,158,200 are for grants.

In 1980 it is expected that a unified management, as well as a common technical approach and facilities utilization (where appropriate) will be implemented to assess the primary and secondary pollutants resulting from coal-fired power plants throughout the U.S. This assessment is at present developed under the various regional programs, such as EPA's project VISTTA and DOE's project MAP3S. Cooperation and coordination will be sought with the Electric Power Research Institute's Project SURE (Sulfate Regional Experiment). The coal-fired power plant pollution assessment will be based on actual field measurements, chamber simulation, basic laboratory studies, and predictive model formulations. The determination of present day pollution (or "pristine") levels, trends due to increased coal usage, and development of predictive models, will be utilized in 1980 as input and guidance to the Office of Air Quality Planning and Standards, and the Regional Offices for setting air quality standards, and for issuance of permits for new coal-fired power plants. In 1980 this program will:

- Determine levels of sulfate and sulfuric acid formation in scrubber plumes.

- Study in smog chambers the secondary pollutants from advanced fuel technology processes.

- Determine rate and mechanisms of NO_x to nitric acid aerosol transformation in plumes (laboratory and field studies).

- Determine TTF of petroleum hydrocarbons, organic and inorganic pollutants and metals in marine and estuarine ecosystems.

- Initiate studies on the transport and fate of mercury compounds originating from coal extraction operations in the western part of the United States.

- Initiate projects which will describe transport, transformation and mixing of contaminants which may be in the discharge from power plants.

- Verify evaluative models of energy-related pollutant transport in aquatic systems.

ENERGY

Research and Development

Measurement Systems and Instrumentation Development
for Energy-Related Pollutants

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase+ Decrease- 1980 vs. 1979
			(dollars in thousands)		
Appropriation.....	$9,344	$9,485	$8,265	$8,537	+ $272
Permanent Positions..	15	1	1	1	...
Full-time Equivalency.	...	...	39	34	-5

Budget Request

An appropriation of $8,537,000 is requested for 1980. This represents an increase of $271,900 from the 1979 level, which will be used for strengthening quality assurance and air monitoring support in areas of Midwest and Eastern U.S.

Program Description

Most of the reserve energy resources of this Nation are located in the relatively environmentally pristine western states. This program is directed toward identifying and quantifying ambient pollutants associated with expanding energy development and toward development of associated pollutant measurement capabilities. The major objectives of the program are to establish a baseline of environmental data so that the multimedia impact on environmental quality from anticipated energy development can be quantitatively established, and to develop validated sampling and analytical methods and procedures to ensure a measurement capability for pollutants from emerging energy technologies.

1978 Accomplishments

Current standards address the gross pollutants - SO_x, NO_x, particulates, etc. - but results from characterization studies show that a variety of very hazardous substances are emitted in small amounts. The monitoring equipment provided by this program will be used to identify and measure both the hazardous substances that originate from energy-related facilities and the secondary pollutants that arise when these primary emissions either decompose by interaction with sunlight or react with other molecules in the atmosphere. In many cases, secondary pollutants could be more hazardous than the primary ones, or hazardous pollutants could be rendered relatively innocuous within a very short residence time in the atmosphere. This information will enable the EPA to establish regulations which provide an adequate margin of safety where the hazard posed by a pollutant so warrants, while avoiding unnecessary or overly stringent controls. Program obligations for 1978 include $5,597,900 for interagency agreements; $2,050,000 for contracts; and $262,800 for grants. Among the 1978 Accomplishments are the following:

- The first major comprehensive chemical analysis of energy-related wastes was completed. It covered coal liquefaction and gasification plants, coal-fired power plants and oil shale process plants. More than one hundred aqueous and solid samples were characterized. Some samples contained more than 200 different specific organic compounds, among which were polynuclear aromatic hydrocarbons, a class of chemical species suspected of causing cancer.

- A regional visibility monitoring network was established in the energy resources development areas of the Southwest U.S. and a research station was set up at Canyonland National Park for evaluation of visibility monitoring techniques.

- A regional sulfate/nitrate monitoring network encompassing the entire Western Energy Resource Development area was established.

- The data base for analysis of the environmental impact of coal strip mine development in the Western Energy Resource Development area was expanded by U-2 aircraft reconnaissance support from NASA.

- Quarterly blind performance audits for parameters of six different air pollutant analyses were conducted on schedule among the 18 laboratories participating in the Western/Energy Environment Monitoring Study.

- The long-standing artifact problem encountered in making accurate measurements of sulfates, free acid and nitrates in ambient aerosols was solved by the substitution of high purity quartz filters for the commonly used glass fiber filters.

- Several contractor efforts were successfully completed including development of: continuous monitoring device for total dissolved gas pressure; sample concentration techniques via ion-exchange membranes; an oil-in-water monitor; and special ion-exchange chromatographic columns for toxic metals from energy sources.

- A video tape method for measuring stream velocity, a microwave technique for measuring river stages (depths) and artificial controls for measuring sediment-laden river flows were developed.

- Hardware and software for LANDSAT and aircraft multi-spectral scanning (MSS) data analysis for strip mine impact assessment were developed.

- Advanced remote sensing imagery techniques for assessment of environmental impacts surrounding western strip mines were defined, tested and demonstrated. Procedures and guidelines for using these techniques were prepared for regional, State and local offices to enable the transfer of the technology to these offices.

- The first stage of development of a second-generation air-borne laser light detection and ranging system for characterizing atmospheric particulates in industrial and urban plumes has been completed.

- Two phases of the groundwater quality monitoring methodology; the identification and priority ranking of potential pollutant sources; and design and development of monitoring procedures for such sources of groundwater pollution as oil shale processing facilities were completed.

1979 Program

The 1979 allocation for this program is $8,265,100. Of these resources, $4,418,000 are for interagency agreements; $1,981,000 are for contracts; and $802,200 are for grants. The 1979 program represents essentially a continuation of the 1978 program. Program activities and planned accomplishments for 1979 include:

- Development of a master analytical scheme employing a gas chromatograph/mass spectrometer system for the simultaneous identification and quantification of all volatile organic compounds likely to be encountered in waste streams from energy sources. The system uses internal reference standards and a computer containing the "fingerprint" of more than 30,000 chemical species.

- Continuation of the Water and Air Monitoring Quality Assurance Program for the Western Energy/Environment Monitoring Study at the same level and initiation of full implementation of the Eastern Quality Assurance Program.

- Completion of the development and testing of the stream sediment sampler and the video tape system for measuring river velocity and flows.

- Determination of the composition and concentration of primary and secondary air pollutants from oil shale processing plants.

- Characterization of inorganic secondary pollutants from a low-BTU Lurgi coal gasification plant in Yugoslavia.

- Continuation of the NASA aerial surveys to expand the data base for strip mine impact assessment.

- Initiation of a joint EPA/NASA program to utilize satellite imagery for studying sulfate transport and transformation in air masses.

- Development of analytical methods for hazardous organics in the effluents from coal gasification and liquefaction plants.

1979 Explanation of Changes From Budget Estimates

The net decrease of -$1,219,900 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$196,300. A net increase of +$3,600 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of congressional changes to appropriations affecting the exchange of functions with the Department of Energy, -$77,200 was reprogrammed within this activity to transport and fate of energy-related pollutants. In addition, -$950,000 was reprogrammed to scientific assessment within the interdisciplinary medium as part of the agency's ZBB review of its resource requirements for the FY 1979 operating plan.

1980 Plan

The total allocation for this program for 1980 is $8,537,000. This represents an increase of $271,900 from the 1979 level, which will be used for strengthening quality assurance and air monitoring support in areas of Midwest and Eastern U.S. Of the $8,537,000 requested for 1980, $4,559,600 are for interagency agreements; $2,092,900 are for contracts; $822,200 are for grants. The 1980 plan includes maintaining the 1979 emphasis on potentially hazardous organics from energy technologies while continuing to perform baseline air and water quality monitoring in those areas of the nation, both eastern and western, where greatly expanded energy development is occurring. Planned activities for 1980 include:

- Development of specific and sensitive water monitoring systems for toxic and hazardous materials.

- Development of a more sensitive and flexible field instrument to measure the presence of oil in water.

- Continue the Air and Water Quality Assurance Program to support the Western Energy/Environment Monitoring Study. This includes provision of quality control check samples and performance samples for all laboratories participating in the Western Energy/Environment Monitoring Study.

- Publication of a report on inorganic secondary pollutants found in scrubber plumes.

- Completion of field tests and verification of artificial controls for measuring sediment-laden flows in streams.

- Completion of five site-specific hydrologic-related studies in coal mining areas in the eastern states.

- Extension of the gas chromatograph/mass spectrometer Master Analytical Scheme to include procedures for solid samples and sediments.

ENERGY

Research and Development

Health Effects Of Energy-Related Pollutants

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase+ Decrease- 1980 vs. 1979
			(dollars in thousands)		
Appropriation.....	$12,278	$20,710	$20,078	$18,387	- $1,691
Permanent Positions....	5	2	3	3	...
Full-time Equivalency..	...	...	7	6	-1

Budget Request

An appropriation of $18,387,000 and three positions is requested for 1980. This represents a decrease of $1,690,500 from the 1979 level. The reduction in resources comes from research on exposure to the oxides of nitrogen and sulfur.

Program Description

The health effects research program is dedicated to improving the ability to estimate the long-term adverse health impacts that can ensue as a consequence of implementing a particular energy policy. Of major concern are those health endpoints which may result as a consequence of long-term, low-level exposures and that manifest themselves only after a long period of time -- carcinogenicity, teratogenicity, mutagenicity and system dysfunction such as cardiopulmonary system disorders. The necessary data are obtained through a coordinated program of clinical, epidemiological, and toxicological studies, and through the development and use of more rapid and sensitive bioscreening techniques.

The program is divided into five related areas which collectively develop the data base necessary to reduce the uncertainties in the estimates of risk to human health. The research in these areas is divided into five categories:

1. Identification of hazardous agents - to utilize simple, inexpensive, and reliable biological assay systems in detecting the presence of toxic, carcinogenic, teratogenic, and/or mutagenic agents associated with energy-related activities.

2. Dose and damage indicators - to develop more rapid and sensitive biological methods to detect and quantify early, sublethal, reparable changes in various target organs or systems which can be useful indicators of irreparable health effects resulting from long-term, low-level exposure.

3. Metabolism of hazardous agents - to define the routes and rates of incorporation, metabolism, deposition, and elimination of hazardous agents in order to ascertain specific tissues, organs, and functions at risk.

4. Evaluation of hazards to man - to quantitatively evaluate short- and long-term hazards to man -- normal, susceptible, and stressed populations -- through simultaneous exposures to combinations of stresses.

5. Damage, repair, and recovery processes - to determine the processes of damage, repair, recovery, protection, and amelioration in biological systems exposed to hazardous agents associated with energy technologies.

1978 Accomplishments

Program obligations for 1978 include $9,253,200 for interagency agreements; $1,689,500 for contracts; and $1,404,100 for grants. Among the 1978 accomplishments are the following:

- Systematic collection of samples from new energy technologies--coal liquefaction, gasification and combustion, oil shale processing and use--and distribution of these samples to participating scientists for a unified and comprehensive program of biological testing to identify carcinogens and other hazardous substances.

- Fractionation and evaluation of shale oil and synthetic fuels derived from coal using Ames mutagenic bioassay has indicated some increased biological activity as compared to conventional sweet crude. The increased activity appears to be related to the presence of aza-arenes in the shale oil.

- A symposium on the utility of short-term tests (nonmammalian and mammalian) for evaluation of biological activity associated with mixtures was held and indicated the need for stepped-up effort to address questions of accuracy, precision, sensitivity and reliability of such systems before attempting to interpret a positive or negative response in terms of quantitative estimates of risk.

- In vitro liver culture systems have been developed as dose and damage indicators and are in the evaluation stage.

- An assay for sulfite in plasma has been developed as a dose and damage indicator which is ultra-sensitive.

- Several multi-marker mammalian cell bioassay systems have been developed for evaluation of single agent dose and damage and appear to be adaptable for mixtures.

- Computer automated recognition patterns have been developed and appear to be useful behavioral testing procedures for primates exposed to a variety of agents.

- A number of final reports of studies on the toxicity of energy-related agents have been made available.

- Contributions were made to the development of a blue-ribbon panel report (Rall Committee) to the President on the health impacts of increased coal utilization in response to his request in the energy message.

- EPA, HEW and DOE developed and implemented the concept of interagency workshops to evaluate the state of knowledge relative to the total spectrum of health and ecological effects of advanced energy systems in response to the President's request in his environmental message.

1979 Program

The 1979 allocation for the health effects program is $20,077,500. Of these resources $16,097,000 are for interagency agreements; $580,000 are for contracts; and $2,567,000 are for grants. This represents a continuation of

accomplishments include:

- Evaluation of raw water and drinking water suspected of contamination by leachates from ash piles and sludges using nonvalidated (level 1) bioassay screening systems.

- Evaluation of emissions from industrial combustors (emphasis on organics - particulate and vapor phase) using in vivo and in vitro bioassay systems.

- Evaluation of heavy metals using several different mammalian cell bioassay test systems - emphasizing teratogenicity.

- Ascertaining validity of in vitro mutagenic/carcinogenic assays for use in evaluation of hazards from energy-related wastes in drinking water.

- Development of bioassay screen for specific behavioral response subsequent to exposure to mixtures of agents.

- Improvement in dosimetry techniques for use in epidemiological/chemical studies, e.g., detection of early changes in lung cell cytology by flow systems analysis techniques.

- Development of model for transfer of energy-related agents across placental barrier.

- Development of model for deposition, metabolism, and fate of inhaled organic coated particulates.

- Evaluation of synergism of multiple stresses in the gas/aerosol complex (organic particulates/NO_x/SO_x) in a well-defined animal model.

- Development of risk assessment modeling techniques for extrapolation for carcinogenic and systemic damage (pulmonary) biological endpoints.

- Performing epidemiological studies of general populations impacted by drinking waters contaminated by leachates from sludges/ash piles or abandoned mines.

- Development of information pertaining to interference (modification of exchange rates) of intestinal absorption of essential nutrients by cadmium and nickel.

- Development of model of damage and repair process of biological molecules--primarily DNA by organic materials and their metabolites.

1979 Explanation of Changes From Budget Estimate

The net decrease of -$632,500 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$277,200. A net increase of +$10,700 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. As a result of congressional changes to appropriations affecting the exchange of functions with the Department of Energy, -$80,000 was reprogrammed within this activity to transport and fate of energy-related pollutants. In addition, -$286,000 was reprogrammed to scientific assessment within the interdisciplinary medium as part of the agency's ZBB review of its resource requirements for the FY 1979 operating plan.

The budget request for the health effects program for 1980 is $18,387,000. This represents a decrease of $1,690,500 from the 1979 level. A number of projects in the Federal Interagency Energy/Environment R&D Program terminate in 1979. These terminations (decreases) include research on exposure to the oxides of nitrogen and sulfur. Of the $18,387,000 planned for 1980, $14,799,300 is for interagency agreements; $528,500 is for contracts; and $2,290,400 is for grants. These resources will be used to fund the first year of a new five-year coordinated interagency program in energy-related health effects research and to fund the second year of the energy-related health projects transferred to EPA management from DOE in 1979 as well as to complete funding for several tasks/projects which could not be completed during the first five-year interagency program. Specific activities to be undertaken are as follows:

- Support repository of energy-related materials (residuals, products) at Oak Ridge National Laboratory to provide uniform samples from various energy facilities and operations to biological effects researchers.

- Develop short-term in vitro tests for nonmutagenic endpoints (cardiovascular disease developmental toxicology, renal function, liver function).

- Validate in vivo models for use with energy-related agents found in drinking waters.

- Ascertain significance of in vivo mutagen/carcinogen assays in use for determining biological activity of energy-related agents in drinking waters.

- Develop rapid in vivo screens applicable to evaluate the teratologic potential of ingested energy-related agents.

- Continue to develop rapid bioassay screens for assessing pulmonary dysfunction, pulmonary carcinogenesis, pulmonary infection, cardiovascular dysfunction from sulfates/SOx, nitrates/NOx and particulates.

- Continue to develop models of mechanisms and rates of incorporation, transport, transformation fate and excretion of energy-related agents - singly and in combination.

- Initiate new animal toxicology studies at molecular, cellular tissue, organ and whole animal levels of organization for the following biological endpoints: mutagenesis, carcinogenesis, teratogenesis, reproductive dysfunction, behavioral toxicology, neurotoxicology and pulmonary toxicology.

- Initiate new studies to estimate dose response relationships for low-level exposures to combinations of agents from data obtained from animal toxicology, cellular toxicology and human health (clinical and epidemiological) studies.

- Determine health impacts of whole emissions from home heating and/or industrial combustors using in vitro and in vivo biological models.

- Initiate new epidemiological studies of occupational, general and susceptible population groups in specified regions. (Both air and waterborne agents).

- Initiate multitechnology supporting studies in mutagenesis, carcinogenesis and systems damage to develop models of damage, repair, and recovery in mammalian systems.

Management and Support

Solid Waste

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Research and Development:					
Appropriation.....	$7,405	$9,112	$8,148	$8,143	-5
Permanent Positions.....	21	22	20	20	...
Full-time Equivalency.....	...	...	29	29	...
Abatement and Control:					
Appropriation.....	27,743	60,173	64,790	59,972	-$4,818
Permanent Positions.....	203	246	248	261	+13
Full-time Equivalency.....	...	...	309	331	+22
Enforcement:					
Appropriation.....	618	1,094	855	2,174	+1,319
Permanent Positions.....	5	28	26	46	+20
Full-time Equivalency.....	...	...	32	52	+20
Total Solid Waste Program:					
Appropriation.....	35,766	70,379	73,793	70,289	-3,504
Permanent Positions.....	229	296	294	327	+33
Full-time Equivalency.....	...	...	370	412	+42
Outlays.....	23,160	21,900	42,340	57,600	+15,260
Authorization Levels.....	181,250	180,241	172,162	*	...

* Authorization pending.

OVERVIEW AND STRATEGY

Solid waste management has emerged as a significant environmental problem. Until the passage of the Resource Conservation and Recovery Act of 1976 (RCRA) the disposal of much of this waste was either unregulated or only partially regulated by State or local governments.

The annual generation of municipal and industrial wastes is estimated at 130 and 344 million metric tons, respectively. Municipal waste water treatment plants produce over 5 million tons of sludge each year, and agricultural and mining wastes amount to additional billions of tons.

The most likely potential damage from improper disposal of solid waste is contamination of ground water. Half of the U.S. population obtains its water supply from ground water. In a 1977 EPA contractor study of 50 industrial waste disposal sites, 43 showed signs of ground water contamination. Other damages can also occur. Contamination of surface waters can result from runoff; air pollution occurs from open burning, evaporation, sublimation, and wind erosion; and poisoning can result either through direct contact or through the food chain. Improper waste disposal provides breeding places for rats and flies and can also result in fire, explosions, odor and litter. All of these problems are common to sites disposing of hazardous or nonhazardous wastes, but may be avoided or controlled through proper siting, design, and operation.

The potential for serious problems caused by improper disposal is compounded when the waste is hazardous. EPA estimates that 80 to 90 percent of hazardous wastes are being disposed of in ways which will not meet minimum RCRA standards.

The Resource Conservation and Recovery Act of 1976 (RCRA) established a national program designed to protect public health and the environment from the damages caused by improper waste management practices, and to encourage resource conservation and recovery. The Act mandates a national program to control hazardous wastes from the point of generation to ultimate disposal. This "cradle-to-grave" control will be achieved through Federal standards for hazardous waste generators, transporters, and treatment, storage and disposal facilities; a nationwide manifest system to track the movement of hazardous wastes; permits to new and existing treatment, storage, and disposal facilities; and enforcement of these Federal requirements. While RCRA provides for and encourages authorization of States to operate the hazardous waste regulatory program, it also requires that EPA operate the program for those States that do not seek or are unable to obtain authorization.

The enforcement provisions of the Resource Conservation and Recovery Act (RCRA) center upon the administrative support of permit issuance, and upon compliance monitoring activities in those States which do not assume responsibility for hazardous waste management. The enforcement program is also responsible for developing the enforcement provisions of regulations implementing RCRA. Hazardous waste generators and transporters must observe certain operational requirements, including recordkeeping, reporting, containerization, and proper manifesting and disposal. Permits from EPA or the States must be procured by all hazardous waste facilities in order to operate legally.

Because the Congress realized that a nationwide solid waste program demands a balanced investment, the Act also sets forth a program for State management of nonhazardous solid wastes. States are to complete comprehensive solid waste management plans which provide a mechnism to ensure the closure or upgrading of existing open dumps; prohibit the establishment of new open dumps; and provide for environmentally sound disposal or recovery for all solid wastes. The Act also requires an inventory, which will be conducted by the States, of all disposal sites to determine whether they should be classified as open dumps or sanitary landfills. This determination will be made for over 100,000 sites based on the criteria established under Section 4004 of RCRA, defining what constitutes a sanitary landfill.

RCRA is to be implemented primarily by the States. The Subtitle C (hazardous waste) program will be operated and enforced by the Federal Government only when a State does not receive authorization. Subtitle D (nonhazardous solid waste) encourages the States to develop nonhazardous waste regulatory programs, but does not mandate a Federal program where States do not wish to operate their own. Nor is there Federal enforcement authority for Subtitle D.

Financial and technical assistance are provided to assist the States in their efforts. Assistance is provided in all areas of solid waste management to Federal, State, and local agencies through Technical Assistance Panels composed of expert contractors, EPA employees, and other experienced public officials. Grants to States are awarded annually for the development and operation of State solid and hazardous waste management programs.

Pursuant to the statute, the major solid and hazardous waste management regulations were to be promulgated 18 months after RCRA's enactment, in April 1978. The task of meeting this ambitious schedule has been complicated by the paucity of technical and economic data and the substantial number of complex and controversial issues to be resolved. The State of Illinois, three environmental groups, and a solid waste trade association sued EPA for failure to meet statutory dates for promulgating these regulations. A court order established a schedule for promulgation, calling for all major regulations to be promulgated by January 31, 1980.

In spite of this delay, progress has been made toward implementing the requirements of RCRA. Major regulations proposed under Subtitle C include criteria for defining a hazardous waste; standards for generators and transporters of hazardous waste; standards for hazardous waste treatment, storage and disposal facilities; procedures for notification of hazardous waste activities; and guidelines for the development of State hazardous waste programs. Under Subtitle D, criteria for the classification of sanitary landfills and guidelines for the development of State plans have been proposed. Grant regulations under both Subtitles C and D have also been proposed.

In anticipation of the promulgation of hazardous waste regulations, some States have begun to implement or upgrade their hazardous waste programs. Several States have legislation and regulations comparable to RCRA and expected Federal regulations, and some States already operate hazardous waste management programs.

By early 1980, most of the major regulations under RCRA are expected to be promulgated and the headquarters program will begin to move into an implementation phase. Major activities in 1980 will be to develop program guidance for implementing the requirements of Subtitle C, to provide technical support for the litigation expected after the regulations are promulgated, and to begin developing guidance and guidelines for specific industries and specific wastes under Sections 3004 and 1008 of RCRA.

The regional offices will continue to work with the States to help them develop, strengthen and implement State programs under both Subtitles C and D. A substantial increase in positions for the regional hazardous waste program will allow for much greater support for the States, which is essential in helping them to develop the capabilities necessary for authorization to operate a State hazardous waste management program. EPA must operate a Federal program for those States that do not seek or are denied authorization. The regions will also be greatly involved in providing technical guidance for preventing hazardous situations and for remedial actions to clean up hazardous waste sites. Response to hazardous waste emergencies will continue to be a top priority.

The prime responsibility of the solid waste enforcement program is to investigate emergencies involving substantial threats to public health and safety to determine the appropriate legal actions required. Additionally, in 1980, enforcement policy will be developed on regional oversight of authorized States and on regional enforcement programs in States without authorization. Initiation of the oversight function or regional enforcement activities, depending upon the status of each State, will be put into operation. Cooperative enforcement agreements with States and Federal agencies will be negotiated and implemented.

Fiscal Year 1980 will be the first year of a 2-year period for interim authorization of State hazardous waste programs. States will be upgrading their programs in order to qualify for full authorization. EPA expects that approximately 41 States will seek and obtain interim or full authorization in 1980. Under Subtitle D, grants will be used to support the disposal site inventory and development of State regulatory programs for nonhazardous waste. As the States become better able to implement and manage nonhazardous waste regulatory programs, the Federal role in this area will decline. A 5-year phasedown of the Federal role will begin in 1980.

Under the President's Urban Policy, a program of grants to local communities for planning and implementation of resource recovery projects was instituted. The first grants (totalling $15 million) under this program will be awarded in 1979, and additional grants of almost $14 million will be awarded in 1980.

Research and development activities will continue to focus on the technology and techniques which can contribute to effective and economical disposal practices for solid and hazardous wastes. The approach will address such areas as the various ways in which waste is disposed on land, ways in which past practices that pose problems can be remedied, and ways in which useful resources can be recycled from waste material. The approach also calls for assessing the environmental implications of specific industrial operations and contributing to the solution of problems identified. Basic considerations in the overall program will continue to include the economics of applying those technologies and effective techniques which are available and likely to be adopted.

SUMMARY OF INCREASES AND DECREASES	(in thousands of dollars)
1979 Solid Waste Program.....	$73,793
Abatement and Control.....	-4,818
The net decrease is due to a reduction in grant assistance for solid waste management planning (-$5.2 million) as part of a 5-year phase out of Subtitle D grant funding; a reduction in grants for local resource recovery projects (-$1.1 million); and termination of the one-time 1979 grant to New York State for Love Canal (-$4 million). These decreases are partially offset by increases for State hazardous waste management grants (+$3.6 million); for regional hazardous waste personnel (+$1.1 million); and for the development of hazardous waste regulations ($1.8 million).	
Enforcement.....	+1,319
The increase in the enforcement program is due to an increase in the number of enforcement positions, primarily in the regions, (+$.7 million) to enforce the RCRA Subtitle C regulations scheduled for promulgation in January 1980, and to an increase in contract funds (+$.5 million) to train regional enforcement personnel, and to support the evaluation and revision of Subtitle C enforcement strategies.	
Research and Development.....	-5
This minimal decrease is due to a realignment of resources in the 1980 request and essentially maintains the 1979 level.	
1980 Solid Waste Program.....	70,289

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An appropriation of $70,289,000 is requested in 1980. This request, by appropriation account, is as follows:

Research and Development.....	$8,143,000
Abatement and Control.....	59,972,000
Enforcement.....	2,174,000

This represents a decrease of $3.5 million from the 1979 level. This is due to several actions: a nonrecurring congressional add-on for the Love Canal (-$4 million); extramural funding for regulations under Subtitle C (+$1.8 million); financial assistance to State and local governments (-$2.7 million); waste management regulations, guidelines, and policies (-$1 million); hazardous waste management implementation (+$1.1 million); and an offsetting increase in the enforcement appropriation to support additional regional positions and contract funds to enforce RCRA Subtitle C regulations (+$1.3 million).

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.....	$70,379
Congressional increases/decreases:	
Love Canal.....	+4,000
Solid waste management grants.....	+4,000
Academic training.....	+100
Reduction in lapse rate.....	-185
Effect of October 1978 pay raise partial absorption.....	+215
Proposed October 1978 pay raise supplemental	+170
Distribution of October 1977 pay raise.....	+430
Office of Research and Development reprogramming.....	-1,035
Headquarters and regional offices reprogramming.....	-4,281
Current 1979 estimate.....	73,793

Congressional changes to the solid waste media request included an increase of $4 million for Love Canal activities; an increase of $4 million for the grants program; an increase of $100,000 for academic training; and a decrease of $185,000 to implement the $3 million reduction applied to the Abatement and Control and Enforcement appropriations for the lapse rate on filling positions.

Pay raise costs result in a total increase of $815,000 over the original estimate. The agency request included all funds for the October 1977 pay raise in the management and support media, to be distributed by media at a later date. The increase reflected represents the share of this later distribution.

Agencywide reprogrammings resulted in a transfer of $244,000 to water quality; $250,000 to drinking water; $575,000 to interdisciplinary; $1,294,000 to nationwide support costs; and $2,953,000 to agency management activities.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations.....	$35,766	$74,288
Effect of congressional changes.....	+8,000	...
Effect of October 1978 pay raise.....	+400	...
Effect of reprogrammings.....	-5,000	...
Program increases.....	+25,000	-3,000
Change in amount of carryover funds available	-878	-495
Change in rate of obligation.....	+11,000	-1
Total estimated obligations.....	74,288	70,792
(From new obligation authority).....	(72,629)	(69,628)
(From prior year funds).....	(1,659)	(1,164)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

Congressional changes discussed in the previous section are expected to result in an increase of $8 million to obligations. The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $400,000. The effect of all reprogrammings is a decrease of $5 million in obligations.

The increase in budget authority over the 1978 level is expected to result in an increase of $25 million to 1979 obligations; the program changes requested in 1980 are expected to decrease obligations by $3 million.

The amount of carryover funds to be obligated in 1979 is $1,659,000, a decrease of $878,000 from the 1978 level. In 1980, it is estimated that $1,164,000 of carryover funds will be obligated, a decrease of $495,000 from the 1979 level.

A change in the rate of obligation is expected in 1979, which would create an increase of $11 million over the 1978 level. A change in the rate of obligation is expected in 1980, which would create a decrease of $1,000 from the 1979 level.

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -	Page
			(dollars in thousands)			
Appropriation						
Public Sector Activities .	$7,405	$9,112	$8,148	$8,143	-$5	SW-8
Permanent Positions						
Public Sector Activities . .	21	22	20	20	--	
Full-time Equivalency						
Public Sector Activities . .	...	...	29	29	--	

Purpose

Inadequate and environmentally unsound practices for the disposal or use of solid waste have caused air and water pollution, created hazards to health and have been generally wasteful of land and other natural resources. The purpose of this research program, consisent with the goals of the Resource Conservation and Recovery Act of 1976 (RCRA), incudes the development of cost effective technologies for: (1) improving land disposal practices for solid and hazardous wastes which reduce or eliminate adverse environmental effects of such disposal; (2) reducing the harmful environmental effects of existing unsound landfills and restoring areas damaged by those landfills; (3) alternatives to land disposal; (4) the destruction of hazardous wastes or the rendering of such wastes environmentally safe; and (5) the production of usable forms of recovered resources, including fuel, from solid waste. In addition, the program directly supports the needs of the Office of Solid Waste in developing cost-effective technologies and by generating the necessary data base to support Agency regulations and guidelines and/or policies related to solid waste disposal and resource recovery.

Research and Development

Public Sector Activities

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Control Technology	$7,405	$9,112	$8,148	$8,143	-$5
Permanent Positions					
Control Technology	21	22	20	20	--
Full-time Equivalency					
Control Technology	...	...	29	29	--

Budget Request

An appropriation of $8,142,700 and 20 positions is requested for this program. Research will be continued at a level commensurate with 1979 efforts.

Program Description

In the past, solid waste disposal has not always benefited from good engineering practice. In fact, good engineering practices have not been defined for many conditions of disposal for many kinds of waste. Wastes, hazardous and non-hazardous, have been disposed of expediently in whatever land was available and at the lowest cost. Environmental considerations for the protection of land, groundwater, surface waters and air were often ignored with resulting damages. Most significant damages have occurred to groundwater but unfortunately these damages for the most part will go undetected for years, decades or even centuries. Occassionally the results of improper disposal are highlighted by incidents of catastrophic proportions. A recent example is a situation at Love Canal (Niagara Falls, N.Y.) where residents of housing built in the vicinity of a closed out hazardous waste disposal site have been endangered resulting in evacuation of the housing and costly remedial action. As a result of past practices there will be more occurrences similar to Love Canal.

Not only has waste disposal practices been an environmental problem, they have also been wasteful of natural resources. Because of diminishing resources, common sense indicates that resources should be recovered from wastes and reused.

In view of the above and consistent with the RCRA, the research and development efforts in this program are directed toward the development of technologies necessary to achieve environmentally acceptable and cost-effective solid and hazardous waste management practices. Major objectives of the program are:

- To develop methodology and/or equipment to control the release into the environment of materials present in hazardous waste which adversely affect public health and welfare. Prevention of or correction of occurrences such as the Love Canal.

- To evaluate and develop new or improved management practices and methods of collection, storage, transportation, and disposal.

processing, and recovery of resources.

- To establish a technical data base to support the Agency's efforts in developing criteria for sanitary landfills, guidelines for waste management practices and regulations for the control of hazardous waste from generation through disposal which would preclude the establishment of open dumps and life endangering occurrences such as the Love Canal.

- To optimize waste material reuse in manufacturing.

- To reduce residuals generation from processing and pollution control activities.

- To develop prototype spill response mechanisms.

1978 Accomplishments

In 1978, resources were $7,404,500 and 21 positions which included $3,601,500 for contracts, $2,401,100 for grants, and $150,000 for interagency agreements. During 1978 the program:

- Completed laboratory studies and published a report on the attenuation by clay minerals of pollutants in leachate from municipal landfills. To evaluate the relative pollution hazard for municipal landfill leachates, a ranking system was developed. Results of the study support the use of clay minerals as liners for land disposal sites for municipal and hazardous wastes.

- Completed laboratory studies and published a report on the attenuation in eleven soil types of metals found in highly polluted leachates from combined municipal and industrial wastes. A simulation model for predicting leachate changes with flow through soil was developed.

- Published a manual to provide guidance for municipal officials and engineers in the selection of available engineering technology to reduce or eliminate leachate generation from existing and closed dumps and landfills.

- Conducted a state-of-the-art study on land cultivation technique for disposal of industrial and municipal solid wastes. Included in the study was an evaluation of field data on operational procedures, costs, environmental impacts and problem definition.

- Completed the evaluation and published a report on vegetation problems associated with 60 different refuse landfills in nine major climatic regions. This information will be useful to landfill managers who deal with the problems associated with establishing vegetation on landfill sites.

- Conducted a symposium on land disposal of hazardous wastes and published proceedings. The technical areas covered include: methods development and cost assessment; identification of pollutant potential; prediction of pollutant migration; and disposal alternatives.

- Completed assessment of four biological systems used for the treatment of hazardous organic materials. Assessment included: identification of the wastes that were successfully decomposed and wastes that would not respond to biological treatment; determination of treatment efficiency, time required for decomposition and economic parameters.

- Completed a state-of-the-art study of current technology and practices for pesticide disposal.

mixtures.

- Demonstrated that scrap tires can be processed as an additive to asphalt for highway construction and resurfacing. The studies conducted in Texas, Arkansas, Idaho, Montana, Wyoming, South Carolina and Georgia indicate that rubberized asphalt is significantly more durable than conventional materials.

- Established that it is feasibile to use waste glass from resource recovery operations as a curing agent in the manufacture of brick. Results have shown that bricks so manufactured are of higher quality and can be acceptably cured at 100 degrees Fahrenheit lower than conventional bricks.

- Demonstrated that resultant dusts from air cleaning, which contain volatile arsenic dioxide from copper smelting can be fixated.

- Conducted special studies required under RCRA 8002h to establish the adverse effects of solid wastes from active and abandoned mines and to determine levels of sludge generation from the public and private sectors.

1979 Program

Resources allocated to this program for 1979 are $8,147,700 and 20 positions. Of this amount it is estimated that $4,941,600 will be committed to contract efforts, $1,796,300 for grants, and $160,000 for interagency agreements. The 1979 program includes:

- Landfilling: Studies ongoing at the end of FY 1978 will be continued. They include: bench, pilot scale, and lysimeter studies of rates of leachate and gas production under different moisture regimes, gas and leachate migration, leachate attenuation in various soils, characteristics of natural and synthetic liners, and control technology for the treatment of leachate and gas. Site selection, design and initiation of field verification studies of gas and leachate migration model and natural and synthetic liners are being undertaken. These efforts are required to provide engineering guidance for improved site selection, design, operation and maintenance of landfills and to provide data to support Agency sanitary landfill criteria and hazardous waste regulations.

- Hazardous Waste Disposal: The following small scale studies ongoing at the end of FY 1978 will be continued: time and temperature requirements for destruction, detoxification, biodegradation, and bulk encapsulation of hazardous materials. Site selection, design, and initiation of field verification of three of the following processes will be undertaken: thermal processing, disposal pits for pesticides, biodegradation processes, encapsulation, microwave plasma detoxification, and chemical detoxification.

- Remedial Action: Field verification of a remedial scheme at a polluting municipal solid waste site will be continued and in addition a polluting hazardous waste site will be selected, remedial schemes designed, and field verification initiated. Remedial schemes may include such actions as in situ neutralization, injection grouting, slurry wall construction, surface sealing, in situ fixation, leachate collection and treatment, and gas migration control barriers and gas collection.

- Resource Conservation and Recovery: Ongoing research in waste processing and preprocessing for resource recovery and ongoing assessments of existing resource recovery systems will be continued. Studies toward providing a research and development plan for the development of marketable products e.g., protein, animal food, chemical feed stocks, etc. from mixed wastes will be initiated.

cultivation disposal technique for oily wastes will be continued to determine optimum loading on soils, taking into consideration leaching, and effects on plant growth and plant uptake of trace metals if the land is subsequently put back into production.

- Industrial: A major effort consisting of a two year program to assess the environmental impact of hazardous waste generation, current waste management practices, and the development of new control requirements for the mining industry will be undertaken. In addition, the development of a mobile incinerator prototype system to respond to hazardous material spill incidents as well as emergency site restoration activities such as Love Canal will be completed. The balance of the research effort will be directed towards demonstration of detoxification and/or recovery techniques for one waste compound from the organic chemicals industry, as well as evaluating technologies available for recovery of metal values from the ferrous and non-ferrous industry.

1979 Explanation of Changes from Budget Estimates

The net decrease of -$964,300 results from several actions. A net increase of +$71,000 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of the Agency's intensive ZBB review of priorities and changing resource requirements for its FY 1979 operating plan, -$1,035,300 was reprogrammed from this activity to Agency management ($209,600), to quality assurance in drinking water ($250,000), and to scientific assessment ($575,700) within the interdisciplinary medium.

1980 Plan

The FY 1980 plan provides a total of $8,142,700 and 20 positions. It is estimated that $5,000,000 will be expended in contracts, $1,800,000 on grants, and $160,000 in interagency agreements.

Specific items of research include:

- Landfilling: Ongoing laboratory, pilot-scale and lysimeter studies (estimated completion FY 1981), field verification studies initiated in FY 1979 will be continued, and two additional field verifications will be initiated. Field verifications include: (a) pollution transport model for site selection and design, (b) leachate and gas control technology, (c) efficiency of landfill liners and (d) gas and leachate production dependence on moisture regime. These field verifications are needed to provide validity to laboratory and bench scale research undertaken as prerequisites for engineering guidance for improved site selection, design, operation and maintenance of landfills and to provide data to support Agency sanitary landfill criteria and hazardous waste regulations.

- Hazardous Waste Disposal: Studies ongoing at the end of FY 1979 including field assessments of physical, chemical, biological and thermal methods for treatment and disposal will be continued.

- Remedial Action: Ongoing field-scale evaluation of groundwater pollution plume management at one polluting municipal waste disposal site will be continued and field verification studies of remedial schemes at a polluting hazardous waste disposal site will be initiated. Site will be selected and schemes designed in FY 1979. Existing information will be reviewed and candidate remedial measures which are appropriate for polluting surface impoundments will be determined.

- Resource Recovery: Implementation of a plan initiated in FY 1979 to develop marketable products from mixed waste, i.e., protein, animal feed, chemical feedstocks, building materials, road ballast, etc., will begin.

- Alternative Land Methods: All ongoing alternative land methods studies will be completed.

- Industrial: Mining industry assessment and control technology development, detoxification and recovery techniques for spent organic chemicals will be continued, and the development of one recovery technique for the ferrous/nonferrous metals industry will be initiated.

Abatement and Control

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
		(dollars in thousands)				
Appropriation						
Waste Management Regulations, Guidelines and Policies.....	$8,320	$10,368	$12,686	$9,321	-$3,365	SW-13
Financial Assistance.....	14,209	41,200	45,200	42,550	-2,650	SW-13
Waste Management Strategies Implementation.....	1,463	2,590	2,456	3,552	+1,096	SW-13
Technical Assistance.....	3,751	6,015	4,448	4,549	+101	SW-13
Total.....	27,743	60,173	64,790	59,972	-4,818	
Permanent Positions						
Waste Management Regulations, Guidelines and Policies.....	99	103	105	95	-10	
Financial Assistance.....	...	...	...	...	...	
Waste Management Strategies Implementation.....	51	90	91	129	+38	
Technical Assistance.....	53	53	52	37	-15	
Total.....	203	246	248	261	+13	
Full-time Equivalency						
Waste Management Regulations, Guidelines and Policies.....	...	...	152	154	+2	
Financial Assistance.....	...	...	...	...	...	
Waste Management Strategies Implementation.....	...	...	96	131	+35	
Technical Assistance.....	...	...	61	46	-15	
Total.....	...	...	309	331	+22	

Purpose

The solid waste Abatement and Control appropriation encompasses activities related to the promulgation of standards and regulations to ensure proper management and disposal of all solid wastes, and the development of programs to implement these regulations. These activities include developing regulations, providing technical and policy guidance, managing the President's Urban Policy Grant program, assisting and encouraging State programs, providing technical assistance, and for hazardous waste management, operating a Federal program when States are unwilling or unable to do so.

States have the primary role in implementing RCRA. A Federal hazardous waste program will be operated only where a State does not seek or is denied authorization. There is no provision in the Act, however, for a Federal program or for Federal enforcement under Subtitle D. The States are strongly encouraged to carry out the responsibilities outlined for them in the Act, and are provided with financial and technical assistance (under both Subtitles C and D) to enable them to do so.

EPA has the primary role in establishing national standards to ensure proper disposal of nonhazardous wastes and proper management, transport, and disposal of hazardous wastes. For hazardous wastes, this includes promulgating a list and criteria for determining what constitutes a hazardous waste; standards for generators and transporters of hazardous waste and for owners and operators of hazardous waste treatment, storage, and disposal facilities; procedures for permitting hazardous waste facilities and for notification of hazardous waste activity; and requirements for authorized State hazardous waste programs. For nonhazardous wastes, EPA must promulgate criteria defining a sanitary landfill. EPA is also responsible for providing guidance and guidelines for implementing the regulations. EPA will be developing guidance outlining proper waste management practices for specific industries with large volume or other problem wastes. EPA also provides financial assistance to States and technical assistance on all aspects of solid waste management to States and local governments. The abatement and control activities are categorized under the following subactivities:

Waste Management Regulations, Guidelines and Policies. This subactivity involves: (1) the development and promulgation of regulations; (2) the development of technical and policy guidance for implementing regulations; (3) the conduct of engineering, design, environmental, and economic evaluations and assessments of solid waste management technology and practices; (4) technical support for litigation; and (5) national management and oversight of regional implementation activities.

Financial Assistance. This subactivity provides grants to States for developing and operating hazardous waste management programs under Subtitle C of RCRA, and for developing State nonhazardous waste regulatory programs and conducting the disposal site inventory under Subtitle D of RCRA. Grants to local governments are also provided for planning and implementation of resource recovery projects.

Waste Management Strategies and Implementation. This subactivity involves: (1) response to hazardous waste emergencies; (2) oversight of authorized States that are implementing hazardous waste programs; (3) conduct of a Federal program for unauthorized States under Subtitle C; (4) direct support and oversight for implementation of the planning and inventory requirements under Subtitle D; and (5) management of local grants for resource recovery projects under the President's Urban Policy Program.

Technical Assistance. This subactivity provides for national management of the Technical Assistance Panels program; technical assistance to State and local governments on all aspects of solid waste management; public participation and education; and the development and distribution of public and technical information materials.

SOLID WASTE

Abatement and Control

Waste Management Regulations, Guidelines and Policies

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Regulations, Guidelines, Policies/Hazardous Waste	$3,444	$6,600	$5,005	$6,781	+$1,776
Regulations, Guidelines, Policies/Solid Waste	2,497	2,520	2,118	1,805	-313
Regulations, Guidelines, Policies/Resource Recovery	2,167	970	1,413	735	-678
Regulations, Guidelines, Policies/EIS Preparation	212	278	150	...	-150
Love Canal	...	...	4,000	...	-4,000
Total	8,320	10,368	12,686	9,321	-3,365
Permanent Positions					
Regulations, Guidelines, Policies/Hazardous Waste	44	53	52	67	+15
Regulations, Guidelines, Policies/Solid Waste	30	32	33	23	-10
Regulations, Guidelines, Policies/Resource Recovery	24	17	20	5	-15
Regulations, Guidelines, Policies/EIS Preparation	1	1	...	...	...
Love Canal	...	...	...	...	...
Total	99	103	105	95	-10
Full-time Equivalency					
Regulations, Guidelines, Policies/Hazardous Waste	...	...	76	97	+21
Regulations, Guidelines, Policies/Solid Waste	...	...	42	38	-4
Regulations, Guidelines, Policies/Resource Recovery	...	...	34	19	-15
Regulations, Guidelines, Policies/EIS Preparation	...	...	...	...	...
Love Canal	...	...	...	...	...
Total	...	...	152	154	+2

Budget Request

The budget request for this subactivity is $9,321,000 and 95 positions. This reflects a decrease of $3,365,000 and 10 positions from 1979. The 1979 funding level included a nonrecurring congressional add-on of $4 million for remedial work at the Love Canal. An increase is provided for 1980 extramural funding primarily for regulations under Subtitle C.

Program Description

This subactivity includes the promulgation of standards and regulations to ensure proper solid waste management practices and the economic, industrial, technological, environmental, and other analyses which support the rulemaking function. Also included are the development of technical and policy guidance for implementing the regulations and national management and oversight of regional implementation activities. The following program elements are included under this subactivity:

Regulations, Guidelines, Policies/Hazardous Waste. This program element provides for national management of the Subtitle C requirements. This includes the development and promulgation of guidelines, criteria, and regulations for the identification, management, transport and disposal of hazardous wastes, and the supportive analyses and assessments of existing technologies. Also included is the development of guidance to the regions and the States for implementing Subtitle C regulations.

Regulations, Guidelines, Policies/Solid Waste. This program element provides for national management of the Subtitle D requirements. This includes the development and promulgation of the criteria for determining a sanitary landfill; guidelines for completing State solid waste management plans; and guidelines for disposal of large volume or other problem nonhazardous industrial wastes. It also includes the development of guidelines for sludge management under Section 405 of the Clean Water Act. Implementation guidance to regions and States is provided for, as is national oversight of their implementation activities.

Regulations, Guidelines, Policies/Resource Recovery. This program element includes activities related to national management of the President's Urban Policy grant program; promulgation of guidelines for Federal procurement of products with recycled content; the Resource Conservation Committee; and the evaluation of existing resource recovery technologies.

Regulations, Guidelines, Policies/EIS Preparation. This program element provides for the completion of environmental impact statements (EIS) and economic impact analyses for regulations under Subtitles C and D.

Love Canal. This program element contains funding provided in a 1979 congressional add-on for a demonstration project of remedial work at the Love Canal in Niagara, New York.

REGULATIONS, GUIDELINES, POLICIES/HAZARDOUS WASTE

1978 Accomplishments

In 1978, extramural efforts totalled $2,111,168, with contract efforts used to support the development of the hazardous waste regulations mandated under Subtitle C of RCRA. EPA proposed standards for transporters of hazardous waste (Section 3003), procedures for notification of hazardous waste activities (Section 3010), guidelines for development of State hazardous waste programs (Section 3006), and interim regulations for Subtitle C grants. An evaluation to determine the types of hazardous waste incinerators that have the potential for heat recovery was continued, as was a demonstration of landfilling electroplating sludges. The electroplating industry is composed of about 20,000 facilities, the majority of which are very small and may be adversely affected by the Subtitle C regulations. The demonstration will provide assistance and information to these facilities on methods to comply with the regulations. Assessments of two damage cases were completed: creosote contamination of ground water in Minnesota and illegal dumping in a sewer in Louisville, Kentucky.

1979 Program

The current estimate for this program element is 52 positions and $5,004,700, of which approximately $3,403,800 is for extramural funding to provide information, data, and studies to support the Subtitle C regulations. EPA proposed a list and criteria for determining what constitutes a hazardous waste (Section 3001); standards for generators of hazardous waste (Section 3002); and standards for owners and operators of hazardous waste treatment, storage and disposal facilities (Section 3004). Regulations for permit issuance (Section 3005) and for authorized State programs (Section 3006) are being combined with similar regulations under the Clean Water and Safe Drinking Water Acts for National Pollutants Discharge Elimination System (NPDES) and underground injection control (UIC) into one comprehensive regulation. This will be proposed in 1979. A data processing system is being designed to process and analyze data from notification, manifest, and permit activities. The system is being designed to be compatible with existing Federal and State systems and will be used by both Abatement and Control and Enforcement functions.

Detailed facility design and operation manuals will be prepared to give guidance on methods to comply with the Section 3004 (hazardous waste facility) standards. This includes manuals on incineration, landfill, landfarm, storage, surface impoundments, chemical treatment, biological treatment, physical treatment, surface water management, and new treatment techniques. Work on industry specific guidance documents for the electroplating and battery industries will be initiated. Standard methodologies and appropriate handbooks for the waste analysis tests in the Section 3001 regulations will be prepared. A methodology will be developed for assessing the equivalency of waste testing methods other than those prescribed in the Section 3001 regulations.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,595,400 results from several actions. A net increase of $272,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, -$1,868,200 was reprogrammed from this activity to agency management ($573,800) and to agency support ($1,294,400).

1980 Plan

Resources required for this program element are $6,781,000 and 67 positions. This is an increase of 15 positions and $1,776,000 over the 1979 level.

The seven major Subtitle C regulations (Sections 3001-3006 and 3010) will be promulgated. Regulations under Sections 3005 and 3006 (permits and authorized State programs) will be promulgated as part of a consolidated regulation containing permit and State program requirements for RCRA, UIC, and NPDES.

The Agency will respond to technical court remands to assist in defending the regulations against 20 or more expected suits. Largely in response to petitions and litigation, proposals of additional listings and delistings under Section 3001 will begin.

Considerable additional work will be done under Section 3004; $1 million will be earmarked for extramural studies to support these efforts. The Agency will develop technical guidance documents outlining appropriate treatment, storage, and disposal methods for specific industries. Because of technological and economic impact problems, some wastes will not be fully covered when the regulations are initially promulgated. Special, tailored disposal standards or guidance documents will be written for wastes such as fly ash and flue gas desulfurization (FGD) sludges, cement kiln wastes, oil drilling brines and muds, mining wastes and gypsum wastes. These standards will be closely coordinated with BAT/pretreatment and BMP standards developed by the Effluent Guidelines Division to assure technological and economic compatibility.

Day-to-day guidance will be provided to regional and State permit writers on procedural, technical, and financial responsibility requirements of the Section 3005 regulations.

The Office of Solid Waste will manage a damage assessment program, assist regions in responding to emergency situations, and coordinate with the Oil and Special Materials Control Division (in the Office of Water Program Operations) on proper disposal of spill residues.

REGULATIONS, GUIDELINES, POLICIES/SOLID WASTE

1978 Accomplishments

The Agency proposed criteria for classification of sanitary landfills, guidelines for the development and implementation of State plans, and interim regulations for State financial assistance. A strategy and plan were drafted for developing guidelines under Section 1008 to control nonhazardous industrial waste disposal. Studies were initiated on four industries (inorganic chemicals, iron and steel, nonferrous metals, and electric utilities) to characterize the waste streams, develop industry demographics and assess disposal practices and technology to support guidelines under Section 1008. An interagency agreement with the Census Bureau was initiated to develop and operate a data management system for the disposal site inventory. Extramural efforts totalled $1.5 million, and provided support for Section 1008 guidelines for nonhazardous industrial waste, Section 4004 landfill criteria and for the disposal site inventory.

1979 Program

The current estimate for this program element is 33 positions and $2,118,500, of which $934,600 is extramural funding for nonhazardous industrial waste studies, and studies to support Section 1008 guidelines, municipal sludge guidelines, and inventory support. The criteria for classifying a sanitary landfill will be promulgated, as will guidelines for development of comprehensive State plans under Section 4002. Guidelines for municipal sludge disposal under Section 405 of the Clean Water Act will be proposed, as will guidelines for landfilling and landspreading under Section 1008 of RCRA. A strategy and plan for the investigation and control, through Section 1008 guidelines, of nonhazardous industrial waste disposal will be completed. Studies will be initiated of the pulp and paper, agricultural chemicals, textiles, and food processing industries to support development of Section 1008 guidelines. Regulations for State financial assistance will be modified to reflect the limitations on use of Federal grant funds in 1980.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$401,500 results from several actions. A net increase of +$89,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$491,300 was reprogrammed from this element to regulations, guidelines, and policies/resource conservation ($387,600) and to agency management ($103,700).

1980 Plan

Resources required for this program element are $1,805,000 and 23 positions. This is a decrease of 10 positions and $313,500 from 1979. Fiscal year 1980 is the beginning of a 5-year phase down of the Federal role under Subtitle D. In 1980, Federal grant assistance will be limited to funding the disposal site inventory and the development of State nonhazardous waste regulatory programs. EPA will be working with the States to develop user charge systems to finance State programs. The headquarters program will also concentrate on sludge management, control of nonhazardous industrial waste disposal through Section 1008 guidelines, and national management of the disposal site inventory.

The Agency will promulgate regulations for the disposal and utilization of municipal sludge. This will be a single regulation satisfying all provisions of the Clean Water Act and RCRA mandating control of municipal sludge.

Guidelines will be promulgated under Section 1008 for landfilling and landspreading and will be proposed for surface impoundments. These guidelines provide the technical guidance for complying with the Section 4004 landfill criteria and will be used in State permit or permit-like regulatory programs for controlling the disposal of municipal and nonhazardous industrial solid waste. The development of Section 1008 guidelines will be completed for the disposal of special industrial wastes (usually large volume wastes) that will not be listed or defined as hazardous wastes. This includes wastes from the ferrous and nonferrous metals, inorganic chemicals, utility, pulp and paper, textiles, and food processing industries.

REGULATIONS, GUIDELINES, POLICIES/RESOURCE RECOVERY

1978 Accomplishments

In 1978, extramural efforts totalled $1,334,836, primarily for studies under the Resource Conservation Committee and for data collection to support procurement guidelines. The Agency completed development of and solicited public comment on the plan and criteria for award of local resource recovery grants under the President's Urban Policy Program. The second and third reports of the Resource Conservation Committee on national beverage container deposits and a solid waste disposal charge, respectively, were submitted to Congress and the President. Investigations began for future guidelines under Section 6002 for Federal procurement of products with recycled content. These investigations included fly ash and slag as cement supplements, paper products, and composted sewage sludge. High-grade paper separation programs were implemented in 135 Federal facilities. These programs were initiated under Federal guidelines issued under Section 209 of the Solid Waste Disposal Act.

Evaluations were continued of the design and operation of EPA funded demonstration pyrolysis facilities in Baltimore and San Diego, and of privately financed small modular facilities and European waterwall combustion systems. An evaluation of the refuse derived fuel facility in Lane County, Oregon, was initiated.

1979 Program

The current estimate for this program element is 20 positions and $1,412,600, of which $688,600 is for extramural funding. Grants of $15 million will be awarded to urban areas for planning and development of resource recovery and conservation projects under the President's Urban Policy Program. The objective of this program is to assist cities in making the difficult transition from land disposal to resource recovery systems which produce energy and recovered materials. A series of activities including national solicitations; grant awards; initiation of a contract to assist in technical project management; general project management oversight; and program evaluation and refinement will take place.

Federal procurement guidelines will be proposed for fly ash and slag as a cement supplement; recycled paper products; and composted sewage sludge as a soil conditioner or fertilizer. Studies will begin to generate the data base necessary for future procurement guidelines on recycled construction materials and insulation products.

Evaluations will be completed and detailed reports issued on resource recovery facilities in Baltimore and San Diego, on European waterwall combustion systems, and on small modular incinerators with heat recovery. The evaluation of the Lane County, Oregon, facility will continue, and additional evaluations of new facilities will be initiated.

1979 Explanation of Changes from Budget Estimate

The net increase of +$442,000 results from several actions. A net increase of $54,400 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's ZBB review of resource requirements for the 1979 operating plan, +$388,600 was reprogrammed within this activity from regulations, guidelines and policies/solid waste.

1980 Plan

Resources required for this program element are $735,000 and five positions. This reflects a decrease of $677,600 and 15 positions. The Agency will manage the President's Urban Policy grant program for assisting local governments to carry out planning and implementation activities for resource conservation and recovery projects. This involves management of the solicitation for grant proposals, assistance to the regions in evaluating and perfecting project work plans, and oversight of regional project management. This will cover continued management of $15 million in 1979 grant awards and selection and initial management of $13,950,000 in 1980 grant awards.

Federal procurement guidelines will be promulgated for fly ash as a cement supplement, recycled paper products, and composted sewage sludge as a soil conditioner/fertilizer. Guidelines will be proposed for recycled construction materials and for insulation products using recovered materials.

In-depth evaluations will be conducted of the technological, operational, financial, and institutional performance of state-of-the-art resource recovery systems to support technology transfer activities through resource recovery seminars and Technical Assistance Panels. This activity replaces previously funded EPA sponsored demonstration projects.

REGULATIONS, GUIDELINES, POLICIES/EIS PREPARATION

1978 Accomplishments

In 1978, extramural efforts totalled $188,514. Contract studies were initiated on the environmental impacts of the landfill criteria, sludge guidelines, landfill guidelines under Section 1008, and the Subtitle C regulations. Contract studies were also initiated to determine the overall economic impact of the Subtitle C regulations and sludge disposal guidelines, and the impact on selected industries of the Subtitle C regulations.

1979 Program

The current estimate for this program element is $150,000. This amount will provide extramural funding to complete the environmental impact statement (EIS) and economic impact analysis for the Subtitle C regulations.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$127,700 results from a reprogramming to agency management activities.

1980 Plan

No resources are requested for this program in 1980.

LOVE CANAL

1978 Accomplishments

This program was not funded in 1978.

1979 Program

A $4 million congressional add-on was provided to be awarded as a grant to the State of New York for a clean-up demonstration project at the Love Canal.

The Love Canal area is a 16-acre site in the city of Niagara Falls, New York. The Canal was used from the 1930's to 1953 to dispose of drummed chemical wastes, process sludge, fly ash, and municipal wastes

Since that time, severe problems in and around the site have been encountered. Leachate migrated into perched water zones near the surface. Polluted ground water, containing scores of aliphatic and aromatic hydrocarbons, saturated basement walls, filled dumps, and volatilized into the air of basements. Eighty chemical compounds and isomers were identified, including one carcinogen (benzene) and 11 suspected carcinogens, teratogens, or mutagens. Epidemiological data from a survey conducted by the New York State Health Department indicated evidence of severe health effects among the nearby residents, including liver damage, spontaneous abortion, and birth defects.

On August 7, 1978, President Carter declared an emergency at the Love Canal. In a similar declaration, the New York State Health Commission recommended that children under two-years of age and pregnant women whose backyards border the site temporarily move from their homes as soon as possible.

The funds appropriated by Congress will be used to prevent further lateral migration of the leachate from endangering additional residences and to seek to return the area to an environmentally safe and liveable condition. Grant funds will be used to conduct the following major activities:

- Determine the extent of leachate migration and pollution of the underlying aquifer and Niagara River.
- Construct leachate holding tanks and a drain field around the entire Canal.
- Design and construct a permanent treatment and disposal system for managing collected leachate.
- Select sample homes, apply sealant and monitor effects on air quality.
- Perform remedial measures to clean aquifer.
- Monitor and evaluate effectiveness of remedial measures to determine when an area is sufficiently detoxified to allow residents to return.

1979 Explanation of Changes from Budget Estimate

The total program of +$4 million results from a congressional add-on.

1980 Plan

No resources are requested for this activity in 1980 as this was a nonrecurring congressional add-on. Work started in 1979 and will take two-years, but rehabilitation of affected homes should not be expected in less than three-years.

Financial Assistance

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Hazardous Waste Management Financial Assistance....	...	$15,000	$15,000	$18,600	+$3,600
Solid Waste Management Financial Assistance to States.....	$14,209	11,200	15,200	10,000	-5,200
Local Resource Recovery Financial Assistance....	...	15,000	15,000	13,950	-1,050
Total.....	14,209	41,200	45,200	42,550	-2,650
Permanent Positions.....	...	...	...	...	...
Full-time Equivalency.....	...	...	...	...	...

Budget Request

The budget request for this subactivity is $42,550,000. This reflects a decrease of $2,650,000, composed of an increase of $3,600,000 for hazardous waste grants, a decrease of $5,200,000 for solid waste grants, and a decrease of $1,050,000 for local resource recovery grants.

Program Description

This subactivity provides financial assistance to State governments for developing hazardous and nonhazardous waste management programs under Subtitles C and D, respectively, and to local governments for resource conservation and recovery projects. The following program elements are under this subactivity:

Hazardous Waste Management Financial Assistance. This program element provides financial assistance to States to develop and operate hazardous waste programs under Subtitle C of RCRA. Grants are awarded on the basis of a formula which takes into account a State's land area, population, number of hazardous waste generators, and amount of hazardous waste.

Solid Waste Management Financial Assistance to States. This program element provides grants to State solid waste management agencies under Subtitle D of RCRA. Grants are awarded on the basis of State population. These grants support the States in pursuing their responsibilities under RCRA to complete comprehensive solid waste management plans, conduct an inventory of all solid waste disposal sites, and implement State nonhazardous waste regulatory programs.

Local Resource Recovery Financial Assistance. This program element provides grants as part of the President's Urban Policy Program for planning for procurement and design of resource conservation and recovery projects.

HAZARDOUS WASTE MANAGEMENT FINANCIAL ASSISTANCE

1978 Accomplishments

This program was not funded in 1978.

1979 Program

The current estimate for this program is $15 million. Financial assistance will be given to all States which show a good faith effort to run a hazardous waste program that is substantially equivalent to the Federal hazardous waste program. The States' primary activity will be to draft enabling legislation and regulations which will establish the authority and capability for operating substantially equivalent State programs. The following describes a State hazardous waste program substantially equivalent to the Federal program:

- Hazardous waste emergencies will be handled as they occur.
- Assistance will be given for disposal of hazardous wastes on a case-by-case basis.
- Public information and management functions will be established.
- Regulations and guidelines will be developed for all aspects of hazardous waste management including generation, storage, transport, treatment, and disposal of hazardous wastes.
- A management information system will be established for tracking compliance with the manifest system.
- The manifest system will be monitored and enforcement action will be taken against the violators.
- Full permit applications will be evaluated and permits issued to hazardous waste treatment, storage, and disposal facilities meeting applicable State standards.

Grants will range from $75,000 to $1,496,530, with an average of $267,857.

1979 Explanation of Changes from Budget Estimate

There is no change from the budget estimate.

1980 Plan

Resources requested for this program element are $18,600,000, an increase of $3,600,000 over 1979. States will continue to develop their hazardous waste programs. Those that have legislation may amend it to be as consistent as possible with the Subtitle C regulations; others are likely to obtain the necessary legislation. In

Those States meeting minimum requirements will receive interim authorization for up to two years while upgrading their programs to meet the requirements for full authorization. For those States unwilling or unable to obtain authorization, EPA is required to operate a Federal program. At the discretion of the Administrator, unobligated grant funds remaining after negotiation with States in a region, and funds for which no grant application has been received, may be used to meet the costs of a required Federal program in any State which has not applied for, or has been denied, full or interim authorization. Grants will range from $93,000 to $1,855,722, with an average of $332,142.

SOLID WASTE MANAGEMENT FINANCIAL ASSISTANCE TO STATES

1978 Accomplishments

Grants totaling $14,209,000 were awarded in 1978. Grants were awarded under Subtitle D only; however, funds could be used to begin development of State hazardous waste management programs under Subtitle C. In 1978, States substantially completed the process of identifying boundaries of geographic regions which would facilitate sound land disposal practices and promote resource conservation and recovery; and of identifying State and local agency responsibilities as required by Section 4006 of RCRA. States began developing comprehensive solid waste management plans which would meet the six requirements of Section 4003 of RCRA. States prepared to conduct the inventory and began to develop plans for operating hazardous waste programs.

1979 Program

Resources for this program element in 1979 total $15,200,000, which includes a $4 million congressional add-on. In 1979, States will continue the comprehensive planning process and will continue to draft and support passage of legislation and regulations to provide them with an adequate regulatory base to assume their responsibilities under RCRA. This includes regulations governing permitting of new municipal and industrial waste disposal sites; right-of-entry for on-site industrial waste disposal; site monitoring and inspection requirements; compliance scheduling; removal of long-term contract prohibitions; and administrative and judicial enforcement mechanisms. States will continue preparing for the inventory by assessing existing siting and permit or licensing regulations against the proposed landfill criteria and taking action to remedy any inadequacies; and by developing appeal and other administrative procedures.

1979 Explanation of Changes from Budget Estimate

The net increase of +$4 million results from a congressional add-on for solid waste management financial assistance.

1980 Plan

The 1980 plan for this program element is $10 million, a reduction of $5,200,000 from 1979, partially due to the nonrecurring $4 million congressional add-on. RCRA calls for strong State programs for the oversight and regulation of nonhazardous wastes. Since the enactment of RCRA, many States have appreciably strengthened their capacity to assume their responsibilities outlined in the Act. EPA will work with the States to develop a long-term financial base resting on user charges. Federal financial assistance to States under Subtitle D of RCRA

will be phased-out over a 5-year period. Use of Federal grant funds during the five years from 1980 to 1984 will be limited to financing the highest priorities under Subtitle D--completion of an inventory of all solid waste disposal sites to determine whether they should be classified as open dumps (and therefore closed or upgraded) or as sanitary landfills; and development and implementation of State regulatory programs for nonhazardous wastes. Grants will range from $50,000 to $959,390, with an average of $178,571.

LOCAL RESOURCE RECOVERY FINANCIAL ASSISTANCE

1978 Accomplishments

This program was not funded in 1978.

1979 Program

The current estimate for this program element is $15 million. Grants will be awarded as part of the President's Urban Policy Program to provide funds for planning for procurement and design of resource recovery projects. This program will result in a greatly expanded rate of closing open dumps in urban areas and will help to overcome one of the major barriers to resource recovery implementation--inadequate funding for planning activities. Up to 75 grantees will be selected through a national competition. Qualifying cities may use the funds to perform any of the following type of activities necessary to successfully implement a resource recovery system: waste stream and market surveys; financial analyses; selection of procurement, technology, and financing options; analysis and design of necessary ordinances or legislation; site selection; public participation and education; preparation of appropriate bid documents; evaluations of bids; and finalizing contracts for systems, markets, and waste supply. A portion of the funds will be used for a contract to assist with technical management of the grants and to assist in evaluating the program.

1979 Explanation of Changes from Budget Estimate

There is no change from the budget estimate.

1980 Plan

Resources requested for this program element are $13,950,000, a reduction of $1,050,000 from the 1979 level. Funding will continue for this program begun in 1979 and will provide additional cities with front-end planning and implementation grants. It will also provide follow-up funding to the cities funded in 1979.

Abatement and control

Waste Management Strategies Implementation

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Hazardous Waste Management Regulatory Stategies....	$556	$1,512	$1,326	$2,443	+$1,117
Solid Waste Management Program Implementation..	907	1,078	1,130	1,109	-21
Total.....	1,463	2,590	2,456	3,552	+1,096
Permanent Positions					
Hazardous Waste Management Regulatory Strategies...	21	55	56	89	+33
Solid Waste Management Program Implementation..	30	35	35	40	+5
Total.....	51	90	91	129	+38
Full-time Equivalency					
Hazardous Waste Management Regulatory Strategies...	...	...	56	43	-13
Solid Waste Management Program Implementation..	...	...	40	88	+48
Total.....	...	...	96	131	+35

Budget Request

The resources requested for this budget subactivity are $3,551,600 and 129 positions. This provides for an increase of $1,095,700 and 38 positions over the 1979 level. These positions are assigned to EPA's regional offices. The increase is to oversee implementation of the hazardous waste regulations in authorized State, to implement the regulations in unauthorized States, to assist States in conducting the RCRA mandated land disposal inventory, to assist States in developing nonhazardous waste management regulatory programs, and to manage the Urban Policy grants for resource recovery

Program Description

The objectives of the regional office solid waste management program are to develop or assist State programs (hazardous and nonhazardous) in implementing regulations, guidelines, and policies as required under Subtitles C and D of RCRA; to respond to hazardous waste emergencies; and to develop State and regional programs for resource conservation and recovery. The following elements are under this subactivity:

Hazardous Waste Management Regulatory Strategies Implementation. This program element includes activities related to increasing the capacity of States to implement hazardous waste management programs as required under Subtitle C of RCRA. EPA has the authority to authorize States which meet specific requirements for Federal authorization to operate a hazardous waste program. For these States, EPA has oversight responsibility. For any State which does not assume the program, EPA is required to conduct a Federal program.

Solid Waste Management Program Implementation. This program element includes activities related to increasing the capability of States to implement solid waste management programs as required under Substitle D of RCRA. Regional assistance will be provided in developing State plans and State nonhazardous waste regulatory programs. The regions are responsible for managing the conduct of the RCRA mandated land disposal inventory. Development of regional and State resource conservation and recovery programs and management of local resource recovery grants under the President's Urban Policy Program are also provided.

HAZARDOUS WASTE MANAGEMENT REGULATORY STRATEGIES IMPLEMENTATION

1978 Accomplishments

In 1978, the regions responded to hazardous waste emergencies, such as Love Canal in New York. Other spills and smaller disposal problems required the regions to analyze the situation, determine the extent of damage, and make recommendations for cleanup and disposal. Regional support and assistant was provided in the development of State legislation and programs for hazardous waste control. During the development of RCRA Subtitle C regulations, the regions provided field information, participated in working groups, and reviewed draft regulations.

1979 Program

The current estimate for this program element is $1,325,600 and 56 positions. The regions will continue to make hazardous waste emergency response a top priority, conducting technical evaluations and providing recommendations for cleanup and disposal as needed. The Office of Enforcement will determine the appropriate legal actions to take in response to hazardous waste emergencies. The regions will begin strengthening their capabilities to implement the program for those States unwilling or unable to obtain authorization. They will also continue supporting and assisting in the development of State legislation, regulations, and other requirements for full Federal authorization.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$186,100 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriation; the decrease applicable to this activity was -$113,000. A net increase of +$72,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$145,400 was reprogrammed from this element to solid waste management program implementation $15,500) and to agency management ($129,900).

1980 Plan

The resources requested for this program element are $2,442,900 and 89 positions. This is an increase of $1,117,300 and 33 positions over 1979. This increase will enable regions to begin quickly implementing the hazardous waste regulations when they are promulgated in early 1980 by overseeing all authorized States and conducting a Federal program in all unauthorized States. Applications for authorization will be reviewed for consistency and equivalency to the Federal program, adequacy of enforcement and stringency of standards.

Upon authorization of State hazardous waste programs, regional oversight activities will include participating in up to 10 percent of facility inspections; reviewing up to 10 percent of State granted permits; reviewing State manifest programs; and reviewing State program reports.

Regional offices are required to conduct a Federal program in unauthorized States. This will include operating a manifest system and issuing permits. It is expected that 41 States will seek and obtain full or interim authorization, and EPA will conduct a Federal program for 15 States.

SOLID WASTE MANAGEMENT IMPLEMENTATION

1978 Accomplishments

The EPA regions were involved in oversignt of State progress toward meeting the requirements of RCRA. Specifically, the regions assisted States in the development of comprehensive solid waste management plans. The process of State identification of regional boundaries and delegation of agency responsibilities was completed and reviewed by the regions. The States were also assisted in examining and upgrading their regulatory base for all RCRA activities, and in preparing to conduct the inventory of land disposal sites.

1979 Program

The current estimate for this program element is $1,130,300 and 35 positions. In 1979, the regions will continue to assist States in assuming their responsibilities under Subtitle D of RCRA. The regions will assist and review State revisions of regional boundary identifications and delegation of Agency responsibilities for applicability to resource recovery. The regions will also continue to provide assistance in preparing for the inventory. This will include examining State regulations and assessing existing State procedures against the proposed EPA landfill criteria in order to recommend areas where State action is needed before conducting the inventory.

Upon EPA headquarters award of local resource recovery grants under the President's Urban Policy Program, the regions will begin administering and managing the program for grantees within their jurisdiction.

1979 Explanation of Changes from Budget Estimate

The net increase of +$52,200 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$9,600. A net increase of +$46,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for the 1979 operating plan, +$15,500 was reprogrammed to the element from hazardous waste management.

1980 Plan

The resources requested for this program element are $1,108,700 and 40 positions. This reflects a decrease of $21,600 and an increase of five positions over 1979. The regions will negotiate, award, and oversee State grants. Grant funds in 1980 will be directed toward funding the land disposal site inventory and the development of State nonhazardous waste regulatory programs. The regions will begin managing State land disposal inventory determinations.

The President's Urban Policy Program of local resource recovery grants will continue to be managed by the regions.

Regional assistance will be provided as States begin developing and implementing regulatory powers for disposal of nonhazardous waste. This will involve assessing regulatory needs and providing support and advice in drafting legislation. Regional oversight will also be provided as States begin establishing resource conservation programs.

EPA regions will begin planning, implementing, and managing State/EPA agreements under RCRA, the Clean Water Act and the Safe Drinking Water Act. This will provide an integrated and consistent approach to solving pollution problems under these programs. The regions will be involved in negotiating agreements with the States, coordinating them with other EPA and State programs, and monitoring and reviewing them.

Abatement and Control

Technical Assistance

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Technical Information Development.....	$1,312	$1,279	$1,167	$1,065	-$102
Technical Assistance Delivery/Headquarters...	1,994	4,043	2,746	2,967	+221
Technical Assistance Delivery/Regions.....	445	693	535	517	-18
Total.....	3,751	6,015	4,448	4,549	+101
Permanent Positions					
Technical Information Development.....	19	17	17	9	-8
Technical Assistance Delivery/Headquarters...	18	13	17	10	-7
Technical Assistance Delivery/Regions.....	16	23	18	18	...
Total.....	53	53	52	37	-15
Full-time Equivalency					
Technical Information Development.....	...	...	23	17	-6
Technical Assistance Delivery/Headquarters...	...	...	20	19	-1
Technical Assistance Delivery/Regions.....	...	...	18	10	-8
Total.....	...	...	61	46	-15

Budget Request

The resources requested for this budget subactivity are $4,549,000 and 37 positions. This reflects an increase of $101,000 and a decrease of 15 positions over 1979. The decrease in positions reflects a streamlining of technical information development activities, and a decrease in EPA headquarters involvement with technical assistance. The primary role of EPA headquarters will be to provide national program management of the Technical Assistance Panels, while delivery of technical assistance will be primarily through regional or contract efforts.

Program Description

Funding under this subactivity enables EPA to provide States and local governments with technical assistance upon request on solid and hazardous waste management and resource recovery and conservation, and to collect and provide technical information to educate and inform the public about RCRA regulations, guidelines, and policies. Section 2006(b) of RCRA requires EPA to establish Technical Assistance Panels for the purpose of providing technical assistance to State and local governments and Federal agencies. These panels consist of experts from EPA, State and local officials (under the peer matching program), consultants under contract to EPA, or any other individuals serving voluntarily. Peer matching uses officials from one community

The management of the Technical Assistance Panels program, orientation training, and public participation and education are also included. The following program elements are included under this subactivity:

Technical Information Development-- This program element includes the management of public hearings and public participation in the development of all regulations, guidelines and policies. Management of orientation training courses for new Federal, and State employees will be provided. EPA will manage a comprehensive public education and information program on hazardous waste siting issues. The preparation, publication and dissemination of reports to Congress and the President and other publications will also continue.

Technical Assistance Delivery - Regional Offices-- This program element includes regional operation of the Technical Assistance Panels program for State and local governments and delivery of technical assistance by regional personnel.

Technical Assistance Delivery - Headquarters-- This program element includes national program management by EPA headquarters in establishing regional level-of-effort contracts for technical assistance and in managing an evaluation reporting system of the technical assistance provided. Management and monitoring of peer matching technical assistance grants is also included.

TECHNICAL INFORMATION DEVELOPMENT

1978 Accomplishments

Extramural expenditures for this program element were $725,000. Interim guidelines for public participation were developed and proposed as required by RCRA. A total of 43 public hearings and meetings were held in support of the development of regulations under Subtitles C and D of RCRA. Nine grants were awarded to citizen and environmental groups to conduct State and local workshops and other activities to educate the public on problems, issues, and responsibilities concerning solid waste management. In response to approximately 12,000 requests from the public, over 620,000 technical and public information documents were distributed. EPA prepared and published 247 new information projects, including reports to Congress and the President, journal articles, news releases, technical reports, and graphic presentations. The development of an orientation training workshop was initiated for new Federal and State employees involved in all aspects of solid waste management.

1979 Program

The current estimate for this program element is $1,166,600 and 17 positions. This includes a congressional add-on of $100,000 for academic training. In 1979, EPA plans to continue holding public hearings and meetings in order to provide a forum for public comment on proposed regulations, guidelines, and policies; approximately 40 are scheduled. The orientation training workshop, aimed at enhancing the ability of new Federal and State employees to assume their responsibilities under RCRA, will be completed.

EPA will begin the first year of a 4-year public education and information program on hazardous waste siting issues. Citizen fear of hazardous wastes and abandoned sites, and opposition to facility siting have become a major problem of waste management. This program will enhance public understanding of the various components of the problem, and create support for regulatory programs to deal with hazardous and solid waste siting and disposal. Four regional conferences are scheduled for 1979.

The preparation and publication of information documents and reports will continue. EPA plans to distribute 750,000 copies of technical and public information documents to the public.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$112,400 results from several actions. Congress provided an add-on of $100,000 for academic training applicable to this activity. A net increase of +$46,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$258,700 was reprogrammed to agency management.

1980 Plan

The resources requested for this program element are $1,065,000 and nine positions. This reflects a decrease of $102,000 and eight positions from the 1979 level.

EPA will continue to manage public hearings and public participation activities on all regulations, guidelines, and policies. Management of the orientation training workshops will be provided, including the periodic updating of courses and related materials such as training manuals.

EPA will initiate the second year of a 4-year public education and information program on siting issues. Six additional conferences will be scheduled for 1980. These will continue to involve the public in shaping national, State, and local regulatory programs and policies on facility siting which is a principal impediment to proper ultimate disposal of hazardous and solid waste.

The preparation, publication and distribution of information documents and reports will continue on a limited basis.

TECHNICAL ASSISTANCE DELIVERY - REGIONAL OFFICES

1978 Accomplishments

Resources were allocated so that EPA regions could meet the RCRA mandate of providing State and local governments within their jurisdictions with technical assistance on all aspects of solid waste management. In 1978, EPA regions responded to 245 requests through the use of either regional personnel, a contractor, or peer matching.

Two examples of such assistance were Lane County, Oregon, and the University of Florida. Region X assisted Lane County in developing procedures for testing whether performance specifications had been met, before a corporation's solid waste processing facility would be accepted. Region IV assisted the University of Florida in confirming results of a technical and economic feasibility study for utilizing solid waste as an energy source for the campus' electrical needs, and in determining the necessary capacity of such a system and regulatory steps to be taken. In both cases, a large amount of work was accomplished in a short period of time. This was required for Lane County to avoid long delays in implementing the facility and for the University of Florida to receive financial assistance from the State legislature. These efforts consisted of EPA regional personnel, State or local officials, and consultants from EPA technical assistance contracts. The University of Florida effort was coordinated with the Department of Energy.

1979 Program

The current estimate for this program element is $534,800 and 18 positions. In 1979, EPA regions will continue operation of the Technical Assistance Panels program. The program is structured to include individual consultant contracts for each EPA regional office. Each region will be able to maintain comprehensive coverage of State and local governments as they begin to implement their responsibilities under RCRA. The assignment of primary responsibility to the regions exists because they are more familiar with the specific needs of potential clients, and can better integrate Panels' technical assistance with other acitivites, such as the development of regulatory programs.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$158,200 results from several actions. A net increase of $49,000 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$207,200 was reprogrammed from this element to regional management.

The resources requested for this program element are $516,700 and 18 positions. This reflects a decrease of $18,100 from the 1979 level.

EPA regions will continue to arrange and coordinate the delivery of technical assistance through the RCRA mandated Technical Assistance Panels. The wide range of services provided will act as a catalyst for the implementation of RCRA Subtitle C and D regulations through individualized technical support. This technical assistance will continue to be provided through contractor, peer matching, or EPA regional personnel.

TECHNICAL ASSISTANCE DELIVERY - HEADQUARTERS

1978 Accomplishments

Extramural expenditures totalled $945,000 in 1978. EPA headquarters awarded 10 regional contracts and six grants to public interest groups for peer matching services under the Technical Assistance Panels program. EPA developed and issued the Technical Assistance Panels Handbook detailing policies and procedures for Regional Technical Assistance Panels management and evaluation. EPA headquarters responded to 22 requests for assistance from State and local governments. These responses were initiated when regional, consultant, or peer matching expertise was insufficient or unable to respond in a timely manner.

1979 Program

The current estimate for this program element is $2,746,500 and 17 positions. EPA headquarters will be responsible for managing the Technical Assistance Panels program nationally. Specifically, EPA will award and monitor public interest group peer matching grants, conduct monitoring, recordkeeping and reporting activities related to Panels' oversight, and evaluate the overall Panels program. Headquarters personnel will continue to provide direct technical assistance on all aspects of solid waste management when regional, consultant, or peer matching expertise is either insufficiently developed or unable to respond in a timely manner.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,296,000 results from several actions. A net increase of +$46,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$1,342,300 was reprogrammed to agency management.

1980 Plan

The resources requested for this program element are $2,967,000 and 10 positions, an increase of $221,000 and a decrease of seven positions.

The EPA regions will be expected to have developed their own expertise in all areas potentially needing technical assistance, and EPA headquarters personnel will provide direct technical assistance only when other expertise is unavailable.

EPA headquarters will continue to provide national program management of the Technical Assistance Panels. This includes awarding 10 regional level-of-effort technical assistance contracts, awarding and monitoring peer matching grants, and managing an evaluation reporting system to ascertain the effectiveness and responsiveness of the technical assistance provided.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$239,100 results from several actions. First, Congress applied a $3 million reduction for position lapse rate to the Abatement and Control and Enforcement appropriations; -$62,700 was applied to this element. Second, an increase of +$67,400 was due to increase pay costs associated with the October 1978 (1979) pay raise and distribution of the October 1977 (1978) pay raise. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$243,800 was reprogrammed from this element within regional offices and is attributed to regional increase in water quality enforcement.

1980 Plan

The 1980 budget request for solid waste enforcement is $2,174,000 and 46 positions. This represents increases of $1,319,000 and 20 positions which will be allocated to the regions and are required to enforce the solid waste regulations in those States that do not assume the program. The request includes $625,000 for contracts for evaluation of the effectiveness of the national solid waste enforcement program; training in compliance monitoring techniques, application of enforcement remedies, data flow management, regional oversight functions, and qualitative evaluation of State hazardous waste management plans; and support for ADP operations.

In 1980, the solid waste enforcement program will have as its first priority the initiation of enforcement actions in emergencies involving substantial threats to public health and safety. Emphasis will also be placed upon the enforcement aspects of hazardous waste under RCRA, improvement of enforcement methods through greater cooperation with States and Federal agencies, and upon developing and prosecuting cases, of national or regional significance. Additionally, enforcement policy and guidance concerning regional oversight of authorized States and of regional enforcement responsibilities in unauthorized States will be completed. Headquarters staff will provide assistance to the regions in performing oversight functions in authorized States and conducting enforcement functions in unauthorized States. Legal and technical assistance will be provided to the regions in case preparation and prosecution, and to the Office of Solid Waste in development of final regulations. Regional and State personnel will be trained in national policies and procedures. Cooperative enforcement agreements will be established with other Federal agencies and the feasibility of establishing such agreements in unauthorized States will be explored. The solid waste enforcement program will assist in the development of multimedia inspection operations, combining compliance monitoring concerns of various Agency enforcement programs, and will conduct evaluations of the national solid waste enforcement program.

In addition to programwide priorities noted above, regional offices will be responsible for enforcement of notification requirements under Section 3010; about 160 inspections of hazardous waste facilities will be conducted. Compliance monitoring of the terms of solid waste disposal permits will also be undertaken. Priorities and procedures for enforcement oversight in authorized States and Federal enforcement operations in unauthorized States will be established. State hazardous waste management plans will be reviewed for enforcement adequacy and the RCRA manifest system will be monitored. Voluntary compliance with the provisions of the act will be strengthened through contacts with State enforcement personnel and affected industries.

Enforcement

SOLID WASTE

Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Solid Waste Enforcement.....	$618	$1,094	$855	$2,174	+$1,319
Permanent Positions					
Solid Waste Enforcement.....	5	28	26	46	+20
Full-time Equivalency					
Solid Waste Enforcement.....	...	...	32	52	+20

Budget Request

A total of 46 positions and $2,174,000 are requested for solid waste enforcement in 1980. The resources requested will support the enforcement of regulations under the Resource Conservation and Recovery Act of 1976. Solid waste enforcement will primarily be concerned in 1980 with planning and establishing a system to issue permits, with permit issuance beginning in 1981, and with compliance monitoring and enforcement activities in those States that do not assume the hazardous waste management program.

Program Description

The EPA solid waste enforcement program is authorized by the Resource Conservation and Recovery Act (RCRA). This legislation provides for comprehensive control over the handling of solid and hazardous wastes. The Act authorizes EPA to promulgate regulations to control hazardous wastes from the point of generation to the point of final disposal. It is the first legislation to provide for direct Federal enforcement of hazardous waste regulations.

The solid waste enforcement program is responsible for responding to emergencies involving substantial threats to public health and safety and for taking appropriate action to abate such emergencies. The solid waste enforcement program is also responsible for developing the enforcement provisions of regulations implementing RCRA. RCRA requires generators and transporters of hazardous wastes to comply with certain procedural standards, such as recordkeeping, reporting, and proper containerization. In addition, RCRA requires that, during transportation, hazardous wastes be accompanied by a manifest and that such wastes be taken only to permitted hazardous waste management facilities.

The hazardous waste regulations will establish design and procedural standards which will be placed on treatment, storage, and disposal facilities. These include operating standards, recordkeeping, reporting requirements, and acceptance of manifested hazardous wastes only. Hazardous waste management facilities will be required to obtain a permit from EPA or an authorized State in order to operate.

Procedures for the inspection and sampling of facilities which generate, transport, store, treat, or dispose of hazardous wastes will be developed. Guidelines will be promulgated which establish standards of evidence needed to support enforcement actions. Rules of practice governing the issuance of compliance orders and hearings conducted in the assessment of administrative penalties or the suspension or revocation of permits will also be promulgated.

1978 Accomplishments

In 1978, the solid waste enforcement program implemented regional reporting mechanisms for hazardous waste emergencies and developed regional guidance for the exercise of Section 7003 imminent hazard authority. A national enforcement strategy for Subtitle C of RCRA was developed. Rules of practice governing enforcement and compliance related hearings and an interim penalty policy were also developed. Initial enforcement policy on draft regulations and guidelines was formulated. The program also provided extensive assistance and analysis to the Office of Solid Waste in the development of draft regulations and guidelines under RCRA. Resources for this program were $618,000 and five positions, including $420,000 of this total for contracts, including development of manuals, public outreach, and analyses of RCRA enforcement strategies.

1979 Program

The 1979 solid waste enforcement program will have as its first priority at both headquarters and in the regions the initiation of enforcement actions in emergencies involving substantial threats to public health and safety. Other programwide responsibilities include an emphasis upon the enforcement aspects of hazardous wastes under RCRA, improvement of enforcement methods through greater cooperation with States and other Federal agencies, and emphasis upon development of cases of national or regional significance. Further important activities include finalization of all Subtitle C inspection, sampling, and compliance monitoring procedures, and the development of final RCRA penalty policy. Regional personnel will be trained in the implementation of the RCRA enforcement program. Headquarters staff will support the regional review of State plans for enforcement adequacy and will assist regions in case preparation and prosecution activities. Assistance will also be provided to the Office of Solid Waste in the development of final regulations. Regional guidance on enforcement oversight function of States authorized to manage hazardous waste programs will be provided. Cooperative enforcement agreements with the Department of Transportation and other Federal agencies will be developed.

Fiscal 1979 will mark the start-up year for the regional solid waste program with significant resources being provided for the first time to the regional offices. In addition to programwide priorities noted above, major regional activities will include review of State hazardous waste management plans for enforcement adequacy. Contacts will be established with State enforcement programs and affected industries to build support for voluntary compliance with provisions of RCRA.

The 1979 budget includes $855,000 and 26 positions for solid waste enforcement. Of the total funds, $125,000 is to be used for contracts. These contracts will be used for enforcement inspections; laboratory analysis of samples; training programs for regional and State enforcement personnel; and guidance development for enforcement priorities and procedures.

Pesticides

PESTICIDES

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Research and Development:					
Appropriation.	$12,268	$12,398	$15,159	$9,638	-$5,521
Permanent Positions. . .	155	166	168	133	-35
Full-time Equivalency. .	...	...	227	180	-47
Abatement and Control:					
Appropriation.	30,565	36,419	39,996	40,456	+460
Permanent Positions. . .	689	715	689	735	+46
Full-time Equivalency. .	...	...	783	812	+29
Enforcement:					
Appropriation.	10,068	12,363	13,314	12,156	-1,158
Permanent Positions. . .	146	143	146	116	-30
Full-time Equivalency. .	...	...	168	124	-44
Total, Pesticides Program:					
Appropriation.	52,901	61,180	68,469	62,250	-6,219
Permanent Positions. . .	990	1,024	1,003	984	-19
Full-time Equivalency. .	...	...	1,178	1,116	-62
Outlays.	41,347	44,700	57,900	58,600	+700
Authorization Levels . .	65,300	*	81,998	*	

* Authorization Pending.

OVERVIEW AND STRATEGY

The objective of the pesticide program is to protect public health and the environment from unreasonable adverse effects of pesticide products while permitting the use of necessary pest control technologies. This objective is pursued through four principal means: (1) establishment of pesticide residue tolerances on food and feed commodities and review and registration of existing and new pesticide products, (2) use management, (3) enforcement, and (4) research and development.

Review

New pesticide products are registered upon a finding that the product will not pose unreasonable adverse effects to humans or the environment, taking into consideration economic and social costs and benefits and the health and environmental risks stemming from the use of pesticides. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) provides the authority for this process.

The 1972 Amendments to FIFRA require that EPA review and reregister each of the 33,000 federally and 7,500 State registered products now on the U.S. market. Most of these existing products were originally registered by EPA predecessor agencies at a time when chronic health rists (e.g. cancer, birth defects and gene mutations) of exposure to toxic chemicals were not as well understood as they are today. Reregistration thus requires a thorough review of available test data for both acute and chronic health effects on humans, domestic animals, wildlife and aquatic organisms -- a process that requires a much higher level of resources than required for the original registration of each product. Further, there is strong evidence that some of the original data used for registration were based upon health effects testing that was not consistent with current day scientific standards, or that was conducted in a questionable or even fraudulent

In order to use resources efficiently, the Agency has developed a new approach to reregistration--developing generic standards for the active ingredients currently used in pesticide products. Standards are planned for 514 active ingredients. Many of the approximately 1,400 chemicals originally identified as discrete active ingredients have been eliminated because they are not in any currently registered product, are inert, or are similar in nature. Several mixture and formulation standards will be developed for each chemical standard produced. Residue tolerances, established under authority of the Federal Food, Drug and Cosmetic Act, will also be reviewed and specified for each of the food or animal feed crops to which the chemical is applied. Finally, all pesticide products that use the chemical as an active ingredient and meet the stipulations of the standard will be reregistered. The generic approach was authorized by the Federal Pesticides Act of 1978.

To remove from the market those pesticides that pose unreasonable adverse risk, a special program, Rebuttable Presumption Against Registration (RPAR), has been developed. Under this program, suspect chemicals are subjected to an intensive benefit review. The Agency has identified 65 chemicals which it considers to be candidates for possible RPAR action. Agency decisions have been made on one chemical, proposed on an additional four (17 other chemicals have been voluntarily withdrawn from the market after disclosure of risks through the RPAR process), and reviews will be completed on another 23 products in 1979.

Other programs that are key elements of the program to review pesticide products include the following:

Registration, which enables new products to enter the market. Under this program, new pesticide products are registered and current registrations are amended for new uses or new formulations. Registration activity will increase in 1979 and 1980 through implementation of the new Amendments, in particular through the implementation of conditional registration, where registration applications will be approved without a definitive evaluation of all the supporting safety data on the understanding that an eventual definitive safety evaluation will be done when preparing a generic standard.

Special registration, which covers all activities relating to the issuance of experimental use permits under Section 5 of FIFRA to generate data for registration, the issuance of emergency exemptions under Section 18, and the issuance of Section 24(c) special local need registrations, which are handled largely by the States with Federal oversight.

Tolerances, which provide for the establishment of pesticide residue tolerances on food and animal feed crops, under authority of the Federal Food, Drug and Cosmetic Act.

Laboratory audits, in which EPA audits laboratories that perform animal toxicology testing in support of pesticide registration applications to confirm that their procedures are sound and that their test results are valid.

Use Management

The second major element of the pesticide program is use management. Pesticides are classified, based upon their potential harm through misuse, for either restricted or general use. Only trained and certified applicators may apply pesticides designated for restricted use. The training and certification of applicators, either private or commercial, is a task managed largely by the States. To date, all but two States (Colorado and Nebraska) have elected to assume the program with Federal financial assistance. EPA operates the certification and training programs in these two States.

Enforcement

The pesticide enforcement program is designed to support the objectives of regulating pesticide supply and use. The program emphasizes increased State involvement through Federal/State cooperative enforcement grants. Through such grants, the States are able to support comprehensive enforcement programs and apply local expertise to help carry out the national pesticide regulatory program. In 1980, EPA will continue its efforts to involve most or all of the States and Territories in this program. Enforcement activities, either carried out by participating States or by EPA in those States not having grants, will focus on the general areas of insuring industry compliance with registration, classification, and labeling requirements. Criminal investigations will continue on cases of alleged data fraud in private testing laboratories, with assistance as required from the Department of Justice.

Research and Development

The research program places emphasis on three basic elements necessary to identify and evaluate the overall human health and environmental hazards of certain pesticides: (1) identification of the population at risk, (2) assessment of individual exposure, and (3) determination of adverse effects. Registrants have already provided much data on adverse effects. Although there is a continuing need for effects research, particularly on new compounds, first priority will be placed on exposure assessment, because there are currently few data available on this topic. Exposure assessment research will cover the development of protocols to determine occupational exposure to pesticides through their use, general population exposure through all media, and exposure of nontarget fish and wildlife. In addition, and as called for in FIFRA, the pesticide management program is developing "biologically integrated alternatives" to chemical pesticides to control agricultural and urban pests (primarily insects and weeds). The investigations into integrating biological alternatives with other pest control practices (including chemical pesticides) comprise an integrated management research program.

The proposed 1980 program provides for an increase in the production of registration standards in order to complete the reregistration, in roughly a decade, of approximately 40,000 pesticides. Most of these products have never been scrutinized for chronic, low-level, long-term effects. The RPAR process will be completed on the majority of the 65 chemicals originally listed as RPAR candidates. High levels of quality and timeliness on special registrations will be maintained and process improvements made to keep close check on headquarters, regional, and State Sections 5(f), 18, and 24(c) actions. Registration activities will continue at a higher level compared with 1978. Most of the registrations granted will be on a conditional basis. Certification and training activities will center on recertification of private and commercial applicators, certification of Indians, and amendments to State plans.

In 1980, enforcement emphasis will be directed toward responding to emergency situations involving substantial threats to public health and safety. Emphasis will also be placed upon enforcement of pesticide use and application, and improvement of enforcement methods through greater cooperation with States and upon the development of cases of national or regional significance.

Federal pesticide enforcement activities will be directed toward greater support of State grant programs and will focus upon those States not participating in the grant program and those States having programs which do not adequately address certain enforcement concerns. Plans include participation of all or nearly all States and territories.

The 1980 research and development program proposes an increase only in quality assurance. Health and ecological effects research will aim at development and validation of test protocols for chemical fate and effects. The integrated pest management (IPM) program, although undergoing a significant decrease, will remain an extramural effort centering on development of methods and approaches to pest control which reduce adverse environmental effects and costs from traditional methods of pest control. The base quality assurance program focuses on development of reference materials and performance evaluation samples. An increased level of effort in quality assurance will support the development of control procedures for testing of biological effects. Substitute chemical resources, formerly reflected in the Research and Development appropriation, are now included in abatement and control under RPAR reviews.

SUMMARY OF INCREASES AND DECREASES	(in thousands of dollars)
1979 Pesticides Program.	$68,469
Research and Development	-5,521
A decrease of $2.5 million reflects the transfer of the substitute chemical program to the abatement and control appropriation; a nonrecurring congressional add-on of $2.5 million; and other program changes netting to a $.5 million decrease.	
Abatement and Control.	+460
An increase of $2.5 million reflects the transfer of the substitute chemical program from the research and development appropriation; the decrease of approximately $2 million reflects the phasing out of RPAR reviews and emphasis on generic standards.	
Enforcement.	-1,158
The decrease reflects the lessened demand for Federal activity as a result of increased State participation.	
1980 Pesticides Program.	62,250

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An appropriation of $62,250,000 is requested in 1980. This request, by appropriation account, is as follows:

Research and Development.	$9,638,000
Abatement and Control	40,456,000
Enforcement	12,156,000

This is a decrease of $6,219,000 from the 1979 level. The bulk of the decrease results from a reduction in the integrated pest management activity from a nonrecurring 1979 congressional add-on (-$2.5 million) and from a reduced level of effort for the multistate study on biological control of insects and weeds (-$.3 million). The enforcement activity is being reduced by $1.2 million reflecting the shifting emphasis from Federal to State activities. A phasing out of RPAR review activities and emphasis on generic standards results in a decrease of approximately $2 million.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.	$61,180
Congressional increases/decreases:	
Integrated pest management	+2,500
Mosquito control research	+400
Reduction in lapse rate.	-629
Effect of October 1978 pay raise partial absorption.	-212
Proposed October 1978 pay raise supplemental.	+649
Distribution of October 1977 pay raise. .	+1,729
Headquarters and regional office reprogramming	+2,852
Current 1979 estimate	68,469

Congressional changes to the pesticides media include increases in research and development on integrated pest management ($2.5 million) and on mosquito control ($400,000). The congressional reduction of $3 million to the abatement and control and enforcement appropriations on the lapse rate on the filling of positions resulted in a decrease of $629,000.

Pay raise costs result in a total increase of $2,166,000 over the original estimate. The agency request included all funds for the October 1977 pay raise in the management and support media, to be distributed to other media at a later date. The increase reflected represents the share of this later distribution.

Finally, headquarters and regional office reprogrammings result in an increase from interdisciplinary activities ($839,000); from toxic substances programs ($236,000); and from management and support activities ($1,777,000).

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations.	$52,901	$70,945
Effect of congressional changes.	+2,500	...
Effect of October 1978 pay raise	+500	...
Effect of reprogrammings	+2,800	...
Program increases.	+12,000	-4,000
Change in amount of carryover funds available	-1,756	-2,476
Change in rate of obligations	+2,000	...
Total estimated obligations	70,945	64,469
(From new obligation authority).	(66,051)	(62,051)
(From prior year funds).	(4,894)	(2,418)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

Congressional changes discussed in the previous section are expected to result in an increase of $2.5 million to obligations. The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $500,000. The effect of all reprogrammings is an increase of $2.8 million in obligations.

The increase in budget authority over the 1978 level is expected to result in an increase of $12 million to 1979 obligations; the program changes requested in 1980 are expected to decrease obligations by $4 million.

The amount of carryover funds to be obligated in 1979 is $5,796,000, a decrease of $1,756,000 from the 1978 level. In 1980, it is estimated that $3,320,000 of carryover funds will be obligated, a decrease of $2,476,000 from the 1979 level.

A change in the rate of obligation is expected in 1979, which would create an increase of $2 million over the 1978 level.

PESTICIDES

PROGRAM LEVELS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Registration Standards:					
Active ingredient standards initiated.....	1	50	47	50	+3
Active ingredient standards completed.....	...	...	1	47	+46
RPAR Decisions:					
Decisions to RPAR.....	15	...	19	17	-2
Final RPAR decisions.....	1	...	23	20	-3
Toxicology lab audits.....	65	70	70	70	...
Registration:					
Administrative/technical amendments.....	5,496	...	5,600	5,600	...
New chemical registrations.....	21	...	32	32	...
Routine/intrastate registrations.....	2,301	...	2,600	3,340	+740
Reregistrations.....	...	...	2	1,440	+1,438
Special Registrations:					
Number of Section 18 registrations/median processing time in weeks.....	180/8	120/...	220/4	260/4	+40/...
Number of Section 5 registrations/median processing time in days.....	240/240	350/...	240/120	240/120	...
Section 24(c) registrations....	1,200	780	1,500	1,500	...
Tolerances:					
Number of tolerance petitions/turnaround time in days.....	135/160	...	120/105	135/100	+15/-5
Amendments.....	125	...	100	125	+25
Inert ingredient requests.....	60	...	60	60	...
Pesticides Use Management:					
State certification and training plans approved.....	48	4	4	3	-1
Federal agency plans approved.	1	...	4	4	...
Restricted uses classified...	3,300	...	1,000	1,200	+200

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Enforcement					
Establishment inspections.....	2,038*	1,425*	1,698*	1,860*	+162*
Use/reentry and experimental use observations.....	2,945*	3,000*	3,730*	3,795*	+65
Marketplace investigaitons.....	1,450*	3,640*	4,110*	4,660*	+550
Import investigations.....	394*	400*	115*	190*	+75

*Includes State program outputs.

Research and Development

PESTICIDES

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -	Page
			(dollars in thousands)			
Appropriation						
Health and Ecological Effects	$10,688 1/	$10,798 1/	$11,047 1/	$ 8,298	-$2,749	P-10
Industrial Processes . .	1,205	1,200	3,700	900	- 2,800	P-18
Monitoring and Technical Support	375	400	412	440	+28	P-22
Total	12,268	12,398	15,159	9,638	- 5,521	
Permanent Positions						
Health and Ecological Effects	147 1/	158 1/	160 1/	124	-36	
Industrial Processes . . .	-	-	-	-	-	
Monitoring and Technical Support	8	8	8	9	+1	
Total	155	166	168	133	-35	
Full-time Equivalency						
Health and Ecological Effects	...	...	218 1/	171	-47	
Industrial Processes . . .	...	...	-	-	-	
Monitoring and Technical Support	...	...	9	9	-	
Total	...	...	227	180	-47	

1/ Includes Substitute Chemicals Program which will be a comparative transfer to the Abatement and Control appropriation in Fiscal Year 1980.

Purpose

This program supports the Agency's pesticides regulatory activities, including the development of data required to support administrative reviews and litigation. Such data are required not only on the major classes of pesticides now registered by EPA and in common use, but on chemicals considered as possible substitutes for cancelled pesticides. In addition, research is carried out to obtain data which will permit safety evaluations of the "new generation" pest control agents, such as insect viruses, sterility agents, and insect hormones. Research is also undertaken to develop means of pest management which can economically and acceptably reduce the quantity of pesticides applied and, thus, their introduction into the environment.

PESTICIDES

Research and Development

Health and Ecological Effects

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		1980 vs. 1979
Appropriation					
Substitute Chemicals 1/ . . .	$ 2,389	$ 2,500	$2,554	...	-$ 2,554
Health Effects	5,731	5,738	5,850	5,738	-112
Ecological Effects	2,568	2,560	2,643	2,560	- 83
Total	10,688	10,798	11,047	8,298	- 2,749
Permanent Positions					
Substitute Chemicals 1/ . . .	19	35	35	...	-35
Health Effects	77	71	72	72	...
Ecological Effects	51	52	53	52	- 1
Total	147	158	160	124	-36
Full-time Equivalency					
Substitute Chemicals 1/. . . .	...	...	35	-	-35
Health Effects	...	...	102	99	-3
Ecological Effects	...	...	81	72	-9
Total	...	...	218	171	-47

1/ This program will be a comparative transfer to the Abatement and Control appropriation in Fiscal Year 1980.

Budget Request

In 1980 an appropriation of $8,298,000 and 124 positions is requested for the pesticides health and ecological effects program. This represents a reduction of $112,000 in the health effects area and $82,300 and one position in the ecological effects area from 1979 levels. The decrease of $2,554,300 and 35 positions reflects the transfer of Substitute Chemicals Program element to the Abatement and Control Appropriation.

Program Description

The Pesticides health and ecological effects program includes the development of information on the health effects of pesticides and the development of long-term pesticide research strategy. Major areas of ongoing research include (1) determination of human health effects; (2) development of pesticide residue analytical methods; (3) development of model ecosystems; (4) determination of ecological effects; and (5) development of information on substitute pesticides or chemicals as alternatives for those pesticides under litigation or review as potentially detrimental and for those for which registrations are not being renewed.

The health effects research program has three main components: (1) the study of biological effects of commonly used pesticides in laboratory animals, (2) the determination of the level of exposure to pesticides by persons environmentally exposed, (3) and evaluation of carcinogenicity using short term screening tests. These programs provide information to aid EPA in the reregistration of pest control agents and in the formulation of policies involving the registration process. As part of this work the program develops, validates, and utilizes suitable methods and techniques to assess the health effects of pesticides and substitute chemicals.

The research investigating the health and ecological effects of pesticides produces information used extensively by the EPA in regulatory decision-making. In addition to EPA's need to document the environmental impact of exposures to persistent pesticides, considerable attention is focused on the potential health hazards associated with the use of pesticides in agricultural situations. A number of accomplishments in these areas of research have provided a sound basis for the EPA's administrative decisions on the regulation of pesticides.

The program also includes the evaluation for safety of pesticides considered as substitutes for compounds whose registrations are not being renewed; the development and validation of new toxicological and analytical methods; and the provision of technical support to the Office of Pesticide Programs, the enforcement program, and the regional offices, in the form of pesticides research expertise for use in administrative decision-making pertinent to the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Pesticides research supported under FIFRA is utilized by other segments of EPA interested in regulating under different legislative authorities. For example, the issuance of permits and water quality criteria for fresh, estuarine, and coastal waters under the Federal Water Pollution Control Act (P.L. 92-500). Data developed by the pesticides research program are also used in support of pending regulations under the Safe Drinking Water Act (P.L. 93-523).

The ecological effects research program has two components: (1) the study of the ecological effects of pesticides in general and (2) the determination of the ecological effects of specific candidate substitute pesticide chemicals. The general ecological effects portion of the program deals with the determination of fate, transport, and the effects of pesticides and substitute chemicals in ecosystems. As part of this work, the program develops, validates, and utilizes suitable methods and techniques to assess the ecological effects of pesticides and substitute chemicals. The substitute chemical portion of the program deals with the determination of the adequacy, suitability, and availabity of substitute pesticides or chemicals to act as replacements for other pesticides considered problematic by the Agency. This program is instrumental in development of testing protocols and development of hazard assessment models.

SUBSTITUTE CHEMICALS

1978 Accomplishments

The 1978 resources include $1,940,000 in contracts and interagency agreements. FY 1978 accomplishments included:

- health and ecological studies on possible alternatives to the following chemicals studied in the rebuttable presumption against registration (RPAR) process: chlorobenzilate, endrin, strychnine, 1080, BAAM, trifluralin, dimilin, lindane, dimethoate, pronamide, diallate, toxaphene, EBDC, benomyl, EDB, PCP, creosote/coal tars, inorganic arsenicals and 2,4,5-T.

- risk/benefit assessments on RPAR chemicals and their possible alternatives.

1979 Program

In 1979, 35 positions and $2,554,300 are planned for studies on substitute chemicals, including approximately $1,700,000 in contracts and interagency agreements. Commitments for 1979 include the following outputs on RPAR chemicals and their alternatives:

- continuation of extensive benefit analyses and hazard evaluations.

- determination and comparative analysis of transport, fate and exposure data for RPAR.

- development of use patterns, and expansion and updating of the computerized recommendation file and site/pest matrix.

1979 Explanation of Changes from Budget Estimate

The net increase of +$54,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

1980 Plan

In 1980, this program is transferred to the abatement and control appropriation. (See Rebuttable Presumption Against Registration for a description of the program).

HEALTH EFFECTS

1978 Accomplishments

In 1978, the program resources amounted to $5,730,600 and 77 positions. $1,632,400 was spent for contracts, and $1,031,600 for grants. These figures include fund for substitute chemicals research. During 1978 the program:

- Initiated field studies to determine safe reentry times for amitraz (BAAM), zolone, and encapsulated methyl parathion to better define pesticide safety for pesticide and agricultural workers.

- Continued method development studies for determination of low levels of toxaphene and metabolites in adipose tissue to facilitate evaluation of their presence and health consequences in the human. The delayed neurotoxic effects of EPN, DEF, and merphos were determined.

- Determined the effects of carbaryl and 2,4,5-T on the developmental patterns and profiles of the isozymes of lactate dehydrogenase (LDH) and creatinine phosphokinase (CPK) in maternal and neonatal tissues.

- Studied effect of administration, dose level, time bioisomerization and pesticide pretreatment on *in vivo* and *in vitro* metabolism of lindane.

- Investigated the structural region of the molecule responsible for the insecticidal and carcinogenic activities of dieldrin.

- Studied the ability of five pesticides to mutate corn as a screen for potential mutagenic effects in the human.

- Tested 20 pesticides for gene mutation and DNA damage in bacteria and yeast as validation of information to be applied to registration of pesticides under FIFRA.

- Determined the comparative placental transfer of carbaryl in the mouse, rat, and hamster using radio-labelled compounds to facilitate the extrapolation to man.

- Determined the hazardous effects of ethylene oxide by the inhalation route to verify its safety as a fumigant.

- Studied the role of free radical pesticide metabolite intermediates, and the effect of pretreatment with three classes of enzyme inducers on a short-term model substrate assay and identified three new metabolites of the substrate in order to better understand what hazardous effects develop within the human after exposure occurs.

- Studied the hazardous effects of pesticides of the formamidine group and the role of glutathione transferase enzymes in pesticide metabolism. These agents inhibit the activities of the enzymes, prostaglandin synthetase and arylglutathione transferase.

- Implemented a biphenyl hydroxylase enhancement assay and evaluated it against a series of 10 pesticides and a set of known carcinogens and non-carcinogens.

- Implemented a mouse lymphoma mammalian cell mutation test system as part of the battery of procedures for determination of mutagenicity and prediction of carcinogenicity of compounds.

1979 Program

The 1979 resource level for health effects research is $5,850,000 and 72 positions; $616,700 is being spent for contracts and $958,000 for grants.

The 1979 health effects pesticides research program focuses on developing and refining analytical techniques of detecting new generation and other pesticide agents and their metabolites in mammalian tissues, soil, sediment, biological samples, and ambient air, (e.g., to measure toxaphene and its metabolites in the urine and to evaluate collection media and devices for determing polychlorinated Biphenyls and pesticides in air).

Investigations using laboratory animals and selected in vitro mammalian cell cultures are being conducted; these investigations provide research information on the adverse effects of high priority pesticides and substitute chemicals administered at various exposure levels and durations. For example, we are performing DNA synthesis and mammalian cell mutagenesis bioassays to determine the reproductive and other subchronic effects from selected pesticides, such as dinoseb, dibrom, bidrin, and cacodylic acid. An effort is underway to evaluate the neurobehavioral effects on rats of high priority pesticides. Major types of compounds now under consideration are the currently and commonly used pesticides, including garden pesticides and new generation pesticides, and those substitute chemicals being considered as replacements for banned pesticides. In the health research program, inhalation toxicology studies are investigating the exposure of animals to pesticides as gases, vapors, or particulates. Inhalation has been determined to be an important route of exposure to pesticides, e.g., ethylene dibromide. Other studies are underway to reveal the carcinogenicity, mutagenicity, and reproductive effects of pesticides.

The health effects program also conducts human studies, such as those based on clinical investigations of pesticide poisoning cases. Health status surveys of agricultural workers are underway and human exposures from handling pesticides are being evaluated. At the same time, research is underway to improve available field methods of measuring pesticide exposure for use in setting field re-entry standards. Field trials are assessing techniques for measuring exposure, as well as ways of minimizing exposure such as the use of protective clothing and decontamination of spills.

1979 Explanation of Changes from Budget Estimate

The net increase of +$112,000 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

1980 Plan

The 1980 resource level for health effects research will be $5,738,000 and 72 positions, including substitute chemicals. Approximately $681,200 will be spent for contracts, and $1,021,800 for grants. This request reflects a decrease of $112,000 over the 1979 level which will reduce our predictive modeling efforts.

The program will address:

- The level of exposure to pesticides by persons either occupationally or environmentally exposed. Both direct and indirect methods of human exposure measurement will be developed and used. In addition to obtaining exposure data on those priority compounds specified by the Office of Pesticide Programs, emphasis will be given to the development of standard protocols for exposure limitations during routine use. Such determinations will be a registration requirement.

- The usage of representative compounds for extrapolating exposure data from direct applications to other similar compounds.

- The scope of analytical chemical methods development by involving more pesticides in a broader variety of human tissues and environmental media. Emphasis will be on the detection of metabolites in humans and animal tissues, excreta, air, and other environmental media. Analytical methods needed in exposure measurement procedures will be given priority.

- The hazardous effects of those substitute pesticides (SCP) which are under consideration by Office of Pesticide Programs to replace compounds which are banned.

- The development of predictive mathematical models which can be used to assess human dose/response effects from exposure to selected pesticides. Pharmacokinetic studies will be carried out to serve as guide to model development.

- The refinement of animal and cell culture models for assessing the mode of actions of pesticides which are potentially carcinogenic to humans while using the appropriate and accepted battery of *in vivo* and *in vitro* short term screening and validation tests.

- The potential carcinogenicity of pesticides and particularly the relationship between mutagenesis and carcinogenesis to strengthen related assessments. Use of this relationship in development of short term screening test methods will be fully explored. The number of tests used and the related validations for study will be increased.

- The health implications of "new generation" biological pest control agents. Initial emphasis will be given to study of insect viruses. The goal will be the development of adequate test methods for routine use in evaluating the potential human health hazards from these agents.

ECOLOGICAL EFFECTS

1978 Accomplishments

During FY 1978 the budget for pesticides ecological research was $2,568,600 and 51 positions. Extramural expenditures from these funds were $434,600 for grants, $249,300 for contracts and $8,000 for interagency agreements. During FY 1978 the program:

- Determined that Dawicide, a pesticide containing pentachlorophenol (PCP), caused a marked reduction in the formation of estuarine settling communities in flow-through experimental aquaria. Thus, estuaries polluted with PCP compounds may exhibit benthic community suppression over longtime periods following an initial die off.

1979 Program

The 1979 resource level for ecological effects research is $2,642,300 and 53 positions. Approximately $266,600 will be spent for grants and $40,000 for contracts.

The 1979 ecological research program deals with commonly used pesticides and their metabolties, new generation pesticides, and substitute chemicals. It is focused at a variety of trophic levels; that is, the projects range from investigations of the simplest planktonic organisms to complex system interactions. Toxicological studies are carried out to obtain dose/response functions for various durations of exposure in samples of single species. Other projects seek information about the environmental importance of various species. Investigations are being conducted on the potential effects on populations within a species and on the groups of such populations. At the most complex level, the studies investigate how pesticides can affect entire ecosystems; i.e., how pollutant stress can alter the structure and dynamic functional interrelationships among the ecosystem's many components.

The ecology program also develops and refines experimental methods and tools. For example, efforts are under way to improve a technique whereby natural estuarine water flows into an experimental system which allows small organisms to settle out and grow in size and numbers. Effects of various compounds on these groups of organisms can be examined without lengthy manual sample collections. Further, the microcosm is being refined as a major research tool which simulates actual ecosystems or segments in the laboratory where exposure conditions can be carefully controlled. Two examples of the uses of microcosms are the predictive estimation of the movement and tranformation of an agent through an ecosystem and the study of predator/prey relationships. Information on predator/prey relationships is important to determine if a compound adversely affects an organism's nervous system which in turn may impair the organism's ability to escape predation. This could have implications not only to the existence of that particular species, but to community structure as well.

Other projects under way include tests of lethal and sublethal effects of pesticides on organism growth and development. This includes investigations to determine the life stages of representative organisms which are most sensitive to various compounds as well as the effects of pesticides on reproduction, viability of the offspring, and related potential behavioral effects. Validation of laboratory results in natural environments, including samples of animals taken from their natural habitats, is being carried out.

Other research efforts include the:

- Development of terrestrial model ecosystems (microcosms) for comparative measurements of ecosystem routes, rates of movement and transformation, sources and sinks of candidate chemicals which are alternatives to pesticides under RPAR.

- Assessment of the ecological effects of pesticides and other toxics substances using suitable terrestrial microcosms.

- Verification of chemodynamics and effects mathematical models, using laboratory and natural ecosystems. These models were derived from basic physical, chemical and biological data.

1979 Explanation of Changes From Budget Estimate

The net increase of +$82,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

FY 1980 Plan

The 1980 resources for ecological effects research will be $2,560,000 and 52 positions. This is a reduction of $82,300 below the 1979 level which will reduce the emphasis on analytical services that support effects and residue studies. Approximately $502,800 will be spent for grants and $81,900 for contracts.

- Determined using experimental microcosms, that low concentrations of Kepone inhibited growth and oxygen uptake of estuarine microcosms. Therefore, components of estuarine systems already in a degraded state would be adversely affected by Kepone.

- Determined that the pesticide atrazine could to be taken up by the roots of marsh grass in saltwater microcosms. This pesticide could then be passed to those organisms in the food chain which consume plant detritus.

- Determined the effects of variations in temperature, salinity, and sterility on pesticide degradation in laboratory microcosms. This information will be useful in establishing the hazard of using pesticides under various environmental conditions.

- Determined in laboratory systems that antipredator behavior of the grass shrimp was impaired by exposure to sublethal concentrations of certain organophosphorous pesticides. Thus, sublethal effects of pesticides on non-target organisms may cause a significant impact on estuarine ecosystem balance.

- Determined that dimilin, a new insecticide that inhibits organic development in insects, is acutely and chronically toxic to a marine crustacean at parts-per-trillion concentrations. This indicates that should Dimilin reach estuarine waters it may threaten larval or juvenile stages of non-target estuarine crustacean such as shrimp, lobsters, and crabs.

- Determined the acute and chronic toxicity and bioaccumulation of several pesticides to estuarine organisms. This effects assessment information was provided to the Office of Pesticide Programs for use in establishing criteria for reregistration of these compounds.

- Developed "mobile" bioassay techniques for on-site evaluation of pesticide industrial plant discharges.

- Developed new rapid screening techniques for determining exposure assessments of pesticides entering aquatic and terrestrial environments.

- Conducted emergency research on effects of Kepone on the organisms and environment of the James River and Chesapeake Bay.

- Provided expert technical testimony for the Agency's various judicial proceedings concerning pesticides such as endrin, chlordane, and Kepone.

- Provided a preliminary report on Rentachlaronitrobenzene, a reputable presumption against registration candidate, describing its effect on the environment, to the Office of Pesticide Programs. This preliminary report will help determine use restrictions for this pesticide.

- Completed a second parathion/methyl parathion experiment to assess the environmental impact of this pesticide.

- Completed the design of Terrestrial Model Ecosystem (TMC) II and constructed one prototype to test its effectiveness as a pesticide screening tool.

- Completed the first soil core experiment involving dieldrin and 2, 4, 5, -T. This technique is being developed as a rapid screening tool for the Offices of Pesticide Programs and Toxic Substances.

- Published a report, "The Design and Evaluation of a Terrestrial Model Ecosystem for Evaluation of Substitute Pesticide Chemicals", which provides user information on utility of microcosms to determine pesticide effects.

- Developed for the Office of Toxic Substances, a report, "Study of the Chemical and Behavioral Toxicology of Substitute Chemicals in Microtus Voles", which describes toxic reactions in candidate test organisms used in chemical screening procedures.

The 1980 research program will continue carring out the goals of the current program, studying particular compounds of interest to the Agency's regulatory and enforcement offices. Emphasis will be given to the development, standardization, and validation of methods to be used in assessing the environmental exposure and effects of pesticides. These tests include acute, chronic, bioaccumulation, community, behavioral and microbial effects methodologies. The development of terrestrial, marine and freshwater microcosms will continue. Specific protocols for pesticide types will be developed and procedures validated through intra-laboratory comparative testing. New methods will be developed to determine the environmental effects of newly developed but characteristically different pesticides.

Emphasis will also be directed toward the measurement of the effects of pesticide exposure to aquatic and terrestrial organisms, populations and ecosystems. A data base for important pesticides will be developed for use by the Office of Pesticide Programs in establishing generic standards for pesticides, RPAR procedures, etc. Specific protocols for effects assessment will be developed.

Major efforts will also be made toward the measurement of the concentration, duration and timing of environmental exposure to pesticides. Results from this research will be integrated with the effects information into a hazard assessment for each compound or class of compounds.

The following are some of the specific activities planned for FY 1980:

- Develop the protocol for assessing hazards to non-target fish and wildlife from applications of pesticides on farmlands, forests, lawns, and other sites and insure that the protocol can be transformed to data requirements for industry.

- Test RPAR pesticides and suggested RPAR alternatives (representing families of pesticides) to determine "no effect" levels on indicator plants and animals, as well as expand RPAR and alternates tested to include "no effect" levels on communities and in microcosms. Pesticides will be selected in cooperation with the Office of Pesticide Programs either by using the RPAR process or by assessing available data and proposing research to fill identified gaps.

- Develop the protocol to determine transport, fate, and transformation related to exposure assessments in the terrestrial, freshwater, and marine environments.

- Provide necessary analytical services to support effects and residue studies.

- Continue the development of fate and transport protocols.

- Review data and identify knowledge gaps for hazard assessments. Conduct laboratory tests on ecological effects of additional RPAR compounds. Provide synthesis of fate and effects data into hazard assessment model.

- Expand development of protocol work on experimental environments or microcosms and microbial effects.

- Expand quick screening tests for mutagencity, teratogenicity, carinogenicity in aquatic organisms caused by specific pesticides.

- Study the effects of alternate methods of pest control (viruses) on aquatic arthropods.

Research and Development

Industrial Processes

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Integrated Pest Management.	$ 1,205	$ 1,200	$ 3,700	$ 900	-$ 2,800
Permanent Positions					
Integrated Pest Management.	...	...	...	...	...
Full-time Equivalency					
Integrated Pest Management.	...	...	...	...	...

Budget Request

An appropriation of $900,000 is requested for the integrated pest management program for 1980; this is a decrease of $2,800,000 from the 1979 resource level. This is an extramural research program administered with less than one work-year of effort by staff allocated to other pesticide research programs.

Program Description

The pesticides/integrated pest management program encompasses the development and demonstration of integrated pest management strategies based upon sound biological, ecological, environmental, and economic information. Combinations of nonchemical and chemical controls will be optimized to reduce the usage and runoff of chemical pesticides.

The integrated pest management research program supports Section 20(a) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The objective of this program is to reduce dependence upon chemical pesticides as the sole means of pest control and provide economically acceptable control options for agricultural and urban pests. Such options should be equal in efficacy to current methods and be able to be implemented with reasonable ease. The program is designed to couple ecological and biological information with economically acceptable practices to keep the insect or plant pest populations at levels that do not cause economic hardship to the producer or urban dweller. The program is coordinated with the U.S. Department of Agriculture (USDA).

The technical program structure is based primarily upon the study of individual crop ecosystems. Each crop has its own special set of cultural needs and its own unique pest management problems. Crops that require a lot of acreage and heavy pesticide use will receive the major research effort. Crops which have been studied are cotton, citrus, alfalfa, soybeans, stone and pome fruits (primarily apple), pine, and corn. Some insect/multicrop interactions have also been studied in this program.

The strategy of research is similar for all crops. Major insect pests are identified for intensive study. For each crop, insect population dynamics, and biological and ecological influences are carefully determined and their interactions with the plant community are identified. The effects of natural field control mechanisms such as predators, temperature, moisture, diseases, and similar controls are identified and studied. The research information is incorporated into mathematical models so that control tactics and control strategies may be developed for a range of situations in each crop system.

In addition to the crop ecosystem studies, individual control techniques with potential to control specific insect pests receive research attention. The use of insect growth regulators such as juvenile hormones or pheromones to control specific development or life functions of a particular target pest are now being studied.

The use of pesticides within and around homes and urban work places is of continuing concern, especially when people unaware of the danger are in close proximity to potentially hazardous pesticide compounds. To combat this, an urban integrated pest management program has been structured to investigate possible alternative controls for pests found in and around urban structures. Improved sanitation coupled with trapping and the use of predator insects, is the present emphasis of the program. Information is also being gathered on pesticide use practices and social attitudes regarding pests and pest management in urban situations.

Close working relationships are maintained by the EPA program staff with the researchers and in turn with the agricultural experiment stations, extension service agents, farmers, and other pesticide applicators who ultimately implement the research findings. Integrated pest management strategies have been successfully demonstrated in a number of field studies arising from EPA sponsored research.

The distribution of research findings and technology transfer are necessary steps in the research program. In addition to publication in the scientific and popular literature, seminars and workshops are sponsored to meet these needs. In a pilot program in one state, farmers may phone their county Extension Service agents to obtain computer based, up-to-date recommendations for pest control for their specific location.

1978 Accomplishments

The 1978 resource level for this program totaled $1,205,000 and included $1,062,200 for grants and $142,500 for interagency agreements.

A study was completed on a pathogenic virus in the alfalfa weevil. The virus induced chronic infection leading to abnormalities in the weevils visible enough to be recognized by the naked eye. Infected larvae generally grew to maturity but usually failed to pupate; those few which were able to pupate died before emerging to adults. Although the potential value of the pathogen has been demonstrated, (90 percent of the naturally infected larvae died in the laboratory), additional data must be gathered before the virus can be seriously considered in a pest management program under field conditions.

A study was completed on the utilization of pest ecosystem models for prediction and control of pest populations utilizing IPM control programs. The study circumvented the usual inflexibility of models which are supposed to describe dynamic ecosystems, by incorporating components which adapt to the varying characteristics of the population present at any given time. The adaptive mechanism is termed "on-line pest management". By inputting data to the model on parasites, predators, agricultural practices, fertilization levels, plant resistance, climate, weather changes, and state of crop development, it is possible to determine how the crop ecosystem will respond to alternative parameter manipulations such as pest management strategies. It is thus possible to determine economically and biologically, the proper timing and nature of pest control measures. This system is already being successfully used in Michigan to control pests in such crops as alfalfa, sugarbeet, asparagus, onion, and potato.

An urban integrated pest management study was completed which developed control procedures aimed at suppressing several economically and medically important cockroaches which occur within residential structures and in locations adjacent to these dwellings. The closely coordinated, simultaneous utilization of biological control agents, selective chemical applications, habitat modifications, and traps yielded a cockroach management program which was effective and was not based upon the repetitous and frequently unnecessary use of chemical insecticides. The information produced is used by entomologists, commercial pest control operators, public health personnel, and the general populace in their efforts to control urban cockroaches.

1979 Program

Resources devoted to the integrated pest management activity in 1979 are $3,700,000. The program will continue to be totally extramural; $3,000,000 for grants and $700,000 for interagency agreements.

Although the same general program direction is being maintained as in the 1978 research effort delineated above, increased funding will permit a significantly higher level of support for major crop ecosystem studies. Transition from a six-crop ecosystem study program, via an interagency agreement with the National Science Foundation, to a four-crop (cotton, soybean, alfalfa, and apple) ecosystem program, via an interagency agreement with USDA, is being actively initiated following completion of proposal modifications.

The four-crop study is being carried out through a research consortium which brings more than 250 basic and applied scientists, economists, and engineers housed in 15 major land-grant universities, into a team which will develop effective, economical, longer lasting and safer methods for controlling all pests - insects, diseases, nematodes and weeds - of four of our major crops. The crops involved were selected because they represent ecologically-diverse agroecosystems that are subjected to severe pest outbreaks, have complex pest interactions, consume great amounts of pesticides, and are most vulnerable to breakdowns in current technology.

The central unifying theme of the research is the application of computer technology and systems analysis to construct models of crop ecosystems that can provide farmers with reliable information for managing their crops and for controlling pests by the most economical and environmentally beneficial methods. The research requires a massive multidisciplinary effort and will involve agronomists, ecologists, economists, engineers, entomologists, nematologists, plant geneticists, plant pathologists, plant physiologists, systems analysts, and weed scientists.

The project goals will be achieved by developing a better scientific understanding of the significant biological, ecological and economic processes governing the growth of crops; of the population dynamics of the pests and the factors affecting them; and of the interactions amoung these processes and factors. Research is also being done to develop improved crop plants having multiple resistance to disease, arthropod and nematode pests; tolerance to climatic adversity and chemical stresses; and which are more efficient in the utilization of energy, fertilizer and water. Economic impact studies are being made so that costs/benefits to be derived from the new systems may be demonstrated to farmers, society and government. Finally, each crop research team is being formally linked to extension service pilot pest management programs so that new technology may be rapidly transferred to farmers and, in turn, farmer needs can be immediately fed back to the researchers.

The remainder of the integrated pest management program will continue previously established priorities by maintaining support of the following ongoing studies: development of non-chemical control of soil arthropods in the corn ecosystem; insect and disease control techniques for musk thistle; biocontrol of aphids in urban shade trees; control of fire ants around rural property; development of insect mating disruption techniques; and application of on-line predictive models for implementing pest management strategies.

1979 Explanation of Changes from Budget Estimate

The net increase of +$2,500,000 results from several actions. Congress provided add-ons of +$2,500,000 for integrated pest management and +$400,000 for mosquito control. In addition, -$400,000 was reprogrammed to other agency activities to partially absorb the cost of the most recent pay raise.

1980 Plan

The 1980 program will expend $900,000 on extramural research, including $746,100 for grants and $153,900 for interagency agreements. This is a reduction of $2,800,000 of which $2,500,000 is attributable to not carrying forward the 1979 Congressional increment. The remaining decrease of $300,000 reflects a reduced level of effort for the multi-state study on biological control of insects and weeds. There will be no in-house research program and the overall activity will continue the general approach of previous years.

Extramural grants will be relied on for conducting studies on major crop, urban, and other selected ecosystems. Research will continue on non-chemical control of soil arthropods in the corn ecosystem; field techniques will be developed for locating insects, population dynamics will be modeled, and costs of control measures will be studied. The multi-state study on biological control of insects and weeds in cotton, soybean, alfalfa, and apple ecosystems will be continued. Pathogenic controls for selected weed species will be developed. Urban pest management techniques will be studied for controlling turf pests in lawns utilizing pathogenic and prey/predator control technology. Development of field dispersion techniques for sex pheromones to disrupt insect mating will continue. And the application of an ecosystem model as a control system will be developed in a field study in a small, controlled area with a mono-crop ecosystem.

Technology transfer of completed research findings will be accomplished through workshops, preparation of institutional materials based upon research data, and distribution of technical information through Regional Offices and State and Federal extension services.

PESTICIDES

Research and Development

Monitoring and Technical Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Quality Assurance	$375	$400	$412	$440	+$28
Permanent Positions					
Quality Assurance	8	8	8	9	+1
Full-time Equivalency					
Quality Assurance	...	...	9	9	-

Budget Request

The FY 1980 budget request for Pesticides Quality Assurance is $440,000 and 9 positions, an increase of $27,600 and 1 position over the FY 1979 level. This increase will be used to start the development of a repository of special reference materials for quality control of biological testing laboratories and to refine the guidelines and procedures for quality assurance of biological testing laboratories.

Program Description

The Pesticides Quality Assurance program is directed toward the documentation of the quality level of physical, chemical and biological analytical measurement data, expressed in terms of precision and accuracy. This program is needed to support regulatory decisions which cannot be challenged because of the quality of the data and to assure that data used by the Environmental Protection Agency are produced at this level of quality or better. Major objectives are to provide standardized and verified analytical measurement systems capable of generating data of the prescribed quality, and to provide quality control materials which assure that measurement systems continue to perform with in these verified performance standards.

1978 Accomplishments

The 1978 resources for this program amounted to $375,000 and 8 positions, including approximately $110,000 for contracts. During FY 1978 the program:

- Standardized a method for measuring hexachlorobenzene in adipose tissue.
- Determined, through pesticide stability studies, that pesticides in solution have a very slow rate of hydrolysis, except for organophosphates which degrade rapidly.
- Distributed standard pesticide reference materials to over 300 requests including 24 worldwide Office of Pesticides epidemiological laboratories. 2700 standard pesticide reference material were handled.
- Analyzed repository stock by gas chromatography-mass spectragraphic systems.
- Revised the "Analytical Methods Manual for Pesticides Residues".

1979 Program

Eight positions and $412,400 including $10,000 for contracts, are allocated to the Pesticide Quality Assurance program in 1979.

Major activities of the program will include:

- Provision of quality assurance tools, including standardized measurement systems and quality control samples, in support of the Office of Pesticides Programs' contract laboratories;

- Update of the quality assurance manual for pesticide residue analysis;

- Conduct of performance evaluation audits of analysts in the Office of Pesticide Program contract laboratories; and

- Provision of quality assurance services to other EPA laboratories and to the private sector.

1979 Explanation of Changes from Budget Estimate

The net increase of +$12,400 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

1980 Plan

Nine positions and $440,000 are requested for the 1980 program. This increase of $27,600 over the 1979 level will be used to start development of a repository of special reference materials for quality control of biological testing laboratories and to refine the guidelines and procedures for quality assurance of biological testing laboratories. Approximately $170,000 of the 1980 program will be for contracts.

Major activities of the program will include:

- Completion of a method performance evaluation for analysis of alkyl phosphate in urine and toxaphene in soil.

- Development of a standard pesticide reference material (SPRM) for toxaphene in human tissue, toxaphene in soil, and alkyl phosphate in urine.

- Development of a respository of calibration materials for biological testing laboratories.

- Conduct of two intralaboratory performance evaluation audits of analysts in Office of Pesticides Programs' (OPP) contractor pesticide residue laboratories.

- Publication of three user manuals:

  - Criteria and Procedures Guidelines for Biological Testing Laboratories

  - Analytical Reference Standards Manual

  - Quality Assurance Manual

- Provision of quality assurance support to the OPP. Examples of support include:

  Analytical instrument maintenance and calibration services; continue bulk materials repository; and continue SPRM repository.

Abatement and Control

PESTICIDES

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
	(dollars in thousands)					
Appropriation						
Standards setting and RPAR.....	$15,497	$22,924	$23,408	$24,560*	+$1,152	P-26
Registration and Tolerances.....	9,328	10,582	12,102	12,190	+88	P-32
Federal and State Program Support.....	5,740	2,913	4,486	3,706	-780	P-37
Total.....	30,565	36,419	39,996	40,456	+460	
Permanent Positions						
Standards Setting and RPAR.....	232	336	310	335*	+25	
Registration and Tolerances.....	396	349	349	361	+12	
Federal and State Program Support.....	61	30	30	39	+9	
Total.....	689	715	689	735	+46	
Full-time Equivalency						
Standards Setting and RPAR.....	...	...	325	364	+39	
Registration and Tolerances.....	...	...	394	396	+2	
Federal and State Program Support.....	...	...	64	52	-12	
Total.....	...	...	783	812	+29	

* Thirty-five positions and $2,500,000 are included in this appropriation in 1980 for substitute chemicals which have been integrated into the standards setting and RPAR activity within the Abatement and Control appropriation. In prior years these resources were in the Research and Development appropriation.

Purpose

Through the abatement and control program the major features of the EPA pesticides regulatory strategy, review of new and existing pesticide products, and use management, are implemented. The development of standards for pesticide chemicals and products plus the Rebuttable Presumption Against Registration (RPAR) program are carried out under the standards setting and RPAR subactivity. The registration and tolerances subactivity includes resources for pesticide registration, special registration and residue tolerance setting. Under the Federal and State program support subactivity is included in the primary pesticide use management program: applicator training and certification.

The Federal Pesticide Act of 1978, which amended the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), is intended to make the regulation of pesticides more efficient, more effective, and more timely. The cornerstone of the new approach is a program of generic pesticide registration. In the past, registration entailed an examination of risk for each product, one at a time. However, generic registration of pesticides entails a single, comprehensive evaluation of risks and benefits of the active ingredient chemicals common to numerous products, based on all data relevant to the registration decision.

Development of pesticide generic standards will take time and until such standards are developed and the complete new reregistration program is put in place, EPA will grant conditional registrations. Conditional registration will allow the Agency to process applications for registration of new products which are like ones already registered and thus permit such products to enter the market on an equal footing with others already registered. This will, in turn, provide consumers with a wider range of comparable products. Ultimately, all products will be reviewed comprehensively when reregistered under generic pesticide registration standards.

New uses of "old" chemicals and new chemicals will also be eligible for conditional registration if EPA determines that enough information is available to evaluate unique hazards that may be posed by the new uses. The Agency will also issue conditional registrations of new chemicals if the public interest would be served by a registration and if risks during the period required to complete and submit additional studies are not unreasonable. Conditional registration will also be useful for allowing time to meet new data requirements or, in some special cases, for permitting early registraion of brand new chemicals.

In addition to authorizing generic and conditional registration, the new law clarifies many matters relating to the following uses of data:
(1) compensation by one registrant for use of data owned by another registrant;
(2) exclusive use of data submitted for registration of new pesticide chemcials;
(3) protection of specified trade secrets; and several issues pertaining to efficacy data and registration data for "minor uses".

By introducting changes in the handling of data, pesticide registration will be simplified.

The Amendments have also given EPA relatively broad discretion to waive the submission of efficacy data. This will simplify the registration process for the registrant and for EPA review. This new policy relies upon the market-place to police efficacy. If it does not prove to be effective, EPA will reconsider the new approach. In any case, the Agency will continue to consider efficacy when performance of the product bears upon public health.

States now have broader authority and responsibility for registering pesticides. States automatically have authority to register products for use within their boundaries for "special local needs". Formerly, States had that authority only with EPA approval. EPA may, however, disapprove State registration if the use is dissimilar from federal registration, if an imminent health hazard exists or if the State has authorized a use on crops for which no tolerance has been established by EPA.

In order to make effective use of State programs for training and certification of applicators to use "restricted use" pesticides, in 1980 EPA will complete (except for updating) the process of classifying uses by regulation, apart from the registration process. This helps to realize the objectives of the applicator certification program, since almost all States have worked hard to train and certify applicators to handle the restricted products. Restriction of use gives EPA an option short of cancellation to reduce pesticide risks.

PESTICIDES

Abatement and Control

Standards Setting and RPAR

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Registration Standards	$4,452	$11,321	$11,231	$12,452	+$1,221
RPAR Reviews.....	10,347	11,121	12,110	12,045	-65
EIS Preparation.....	61	63	67	63	-4
Market Sample Analysis	637	419	...	...	...
Total.....	15,497	22,924	23,408	24,560*	+1,152
Permanent Positions					
Registration Standards	74	179	161	197	+36
RPAR Reviews.....	136	145	146	135	-11
EIS Preparation.....	2	3	3	3	...
Market Sample Analysis	20	9	...	...	...
Total.....	232	336	310	335*	+25
Full-time Equivalency					
Registration Standards	...	...	162	203	+41
RPAR Reviews.....	...	...	160	158	-2
EIS Preparation.....	...	...	3	3	...
Market Sample Analysis	...	...	...	...	...
Total.....	...	...	325	364	+39

*NOTE: 35 positions and $2.5 million are included in this appropriation in 1980 for substitute chemicals which has been integrated into the standards setting and RPAR activity within the Abatement and Control appropriation. In prior years, these resources were in the Research and Development appropriation.

Budget Request

A total of $24,560,000 and 335 positions is requested for 1980 for standards setting and RPAR. This represents an increase of $1,152,000 and 25 positions over the 1979 level. This includes an increase for generic standards development, which is cruicial to the establishment of a streamlined, resource-efficient registration and reregistration program in the future. The important laboratory audit program will be continued to ensure the validity of data presented by registrants in support of continued or future registrations. The budget will also permit the processing of rebuttable presumption against registration (RPAR) actions, which are necessary to the proper assessment of the health and safety of suspect compounds which are long overdue for regulatory scrutiny.

Program Description

In order to use resources efficiently, the Agency developed a new approach to reregistration--developing generic standards for each of the active ingredient chemicals currently used in pesticide products. EPA will concentrate its effort on the 514 chemicals currently used as active ingredients, which will permit decisions on the reregistration of all existing products. Many of the approximately 1,400 chemicals originally identified as discrete active ingredients have been eliminated because they are not in any currently registered product, are inert or are similar in nature.

There are five phases in the development of a generic standards: (1) data gathering and preparation, (2) scientific review, (3) identification and analysis of regulatory options, (4) regulatory standard drafting, and (5) integration of comments and preparation of the final standard. Several mixture and formulation standards will be developed for each chemical standard produced. Pesticide residue tolerances, previously established under authority of the Federal Food, Drug and Cosmetic Act, will also be reviewed and respecified for each of the food or animal feed crops to which the chemical is applied. (The establishment of new residue tolerances is funded under the registration and tolerances subactivity). Finally, all pesticide products that use the chemical as an active ingredient and meet the stipulations of the standard will be reregistered. (Reregistration, as distinguished from standards production, is funded under the registration and tolerances subactivity, as are resources for new product registrations and amendments to existing registrations). Incorporating this new approach into the Agency's entire pesticides abatement and control program will facilitate registration, reregistration, and RPAR actions.

Special review of pesticide products that are candidates for rebuttable presumptions is a program established to scrutinize chemicals which are suspected of causing undue hazards. The decision to cancel the use of any chemical or family of chemicals requires risk/benefit determination after an in-depth review of potential hazards. Public hearings are conducted, if necessary, to reach final determinations.

The Agency will continue to conduct systematic audits of the quality of laboratory studies, in cooperation with the Food and Drug Administration, and evaluate their impact on decision making. This is being done because of problems discovered which indicate that there are defects in basic studies used to support pesticide registrations. These lab data validations are important to the registration, RPAR, and tolerance setting processes since reliable data is needed to proceed with actions to identify and restrict or remove hazardous pesticides from use as well as to establish chemical standards for streamlined registration and reregistration.

REGISTRATION STANDARDS

1978 Accomplishments

In 1978, a total of $3,001,600 was expended for information services and other contracts to develop a prototype standard and begin the transition from development and testing of the generic standards approach to production of such standards. During this year a prototype standard was developed for the herbicide metolachlor. Development of the production process work flow and detailed procedures for the first phase of the standards process (data gathering) were also completed.

Forty-eight chemicals were selected for which standards would be initiated and work plans were prepared for all chemical standards to be begun during the first quarter of 1979. In addition, seven contracts which were critical to establish a production mode were initiated. Finally, long-term resource estimates were developed and refined during 1978 in order to arrive at staffing and funding levels necessary to complete the program within roughly a decade.

1979 Program

A total of 161 positions and $11,231,300 is available in 1979 of which $8,075,700 are for contracts for information services and scientific data review.

During 1979, the Agency will begin producting standards at a regular rate; 1979 resources will permit the initiation of 47 generic standards, each averaging one active ingredient standard, four formulation standards, one mixture standard and 20 commodity tolerance standards. An entire registration standard will require a median time of 14 months to complete.

1979 Explantion of Changes from Budget Estimate

The net decrease of -$89,300 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$157,800. Finally, an increase of +$208,400 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. This increase was offset by the transfer of -$139,900 to other agency activities to support the costs of the most recent pay raise.

1980 Plan

In 1980, $12,452,000 and 197 positions are requested, of which $8,590,800 are for contracts for information services and scientific data review/validation.

These resources will permit the completion of 47 active ingredient standards initiated in 1979 and the initiation of 50 active ingredient standards in 1980.

The subtasks involved in the development of a generic standard include screening all published literature, company submitted data and other unpublished information; bibliography preparation; data evaluation and assessment of fate, effects and exposure risks and benefits; preparing a regulatory rationale and position; seeking public comment and participation; preparing and publishing the standard document; and managing records with the necessary ADP and micrographic support.

During 1980, EPA will be maintaining the prototype standard completed during 1979 as well as initiating maintenance on new standards as they are completed. The subtasks involved in maintaining completed generic standards include screening all newly published literature, new company data, laboratory data, monitoring data, and accident data and updating the standard, as necessary, from this material. In particular, this effort covers updating standards to include new uses, new tolerances, new special registrations and new data.

At this level of funding, the rate of completion of registration standards during 1980 will be 41 per year. At this rate, the project will require a little over 10 years to complete.

REBUTTABLE PRESUMPTION AGAINST REGISTRATION (RPAR)

1978 Accomplishments

A total of 138 positions and $10,408,000 including EIS preparation was expended including $7,813,600 for contracts for information services, site/pest information, use analyses, scientific exposure/hazard assessments and risk/benefit information.

During 1978, the RPAR process underwent a critical evaluation resulting in major refinements to streamline the process. A work plan system was established for each priority RPAR chemical to maximize use of resoruces. The goal oriented work plans identify the activities to be accomplished, assign responsibility, and establish time frames for each task. In addition, a reporting system was instituted to provide a means for keeping management informed on progress in implementing the work plans and to provide a means of pinpointing potential problem areas. Finally, to provide scientific and technical support throughout the RPAR review and to establish accountability at each stage of the RPAR process, each project manager was assigned a specific Project Support Team comprised of appropriate experts from within the Office of Pesticides Programs (OPP) and the Office of General Counsel.

Another major improvement in the RPAR process was the decision to begin collecting exposure data during the pre-RPAR review of risk instead of after an RPAR has been issued. This approach will reduce the expenditure of resources needed to review chemicals which are potentially hazardous but pose little risk because of minimal exposure.

Also in 1978, a final decision document was prepared on the chemical 1.2-dibromo-3-chloropropane (DBCP). Another 15 chemicals were in various stages of review, after the decision to submit the chemicals to the rebuttable presumption process. This includes analysis of the exposure of humans and the environment to the pesticide, including environmental impact analysis; analysis for oncogenicity, teratogenicity, and carcinogenicity risk; review of the benefits of the different uses of the pesticide; review of the possible substitutes for the chemicals; and assessment of the possible regulatory options. Initial analyses, resulting in the issuance of RPAR notices, were completed for 15 chemicals. Thirty-seven compounds were reviewed for possible referral to the RPAR process and 22 were recommended for a pre-RPAR review (which could result in the decision to issue an RPAR notice). Agreement was reached with the Department of Agriculture which resulted in the formation of DOA/EPA assessment teams for 24 chemicals already in process or whose reviews were planned.

As part of a special program to assess the extent of risk associated with the use of pesticides containing dioxin, 105 samples were collected to determine the presence of dioxin in human milk and urine, 271 samples of various organs were analyzed to determine the statistical validity of dioxin analyses and the lower limit of detection, and 82 samples were analyzed to determine whether detectable levels of dioxin were present in fish, soil and human tissue.

A total of 65 lab audits were performed by the Food and Drug Administration for EPA. Of the audits performed to date, three have been referred for enforcement action (two to the Department of Justice).

1979 Program

In 1979, $12,177,000 and 149 positions including EIS preparation are available including $9,375,800 for contracts for information services, site/pest information, use analyses, scientific exposure/hazard assessments and risk/benefit information.

Final decision documents incorporating environmental impact statements will be prepared for 23 RPAR chemicals and administrative hearings will be conducted as required. RPAR notices will be issued for 19 chemicals suspected of having an adverse effect on humans or the environment. Dioxin sample analyses will be completed in 1979 and 70 laboratory audits will be performed. Twelve special audits will be made of already discovered faulty lab data and 300 registrant validations of possibly faulty lab data will be audited.

1979 Explanation of Changes from Budget Estimate

The net increase in RPAR reviews of +$989,000 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$471,400. An increase of +$874,000 results from increased pay costs from the October 1978 (1979) pay raise and as well as distribution of the October 1977 (1978) pay raise. This increase is offset by the transfer of -$179,600 to other agency activities to support the cost of the most recent pay raise. Finally, as a result of the Agency's ZBB review of resource requirements for the 1979 operating plan, +$766,000 was reprogrammed to this activity from program support.

The net increase in RPAR Reviews/EIS of $3,900 is the result of pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise.

1980 Plan

In 1980, $12,108,000 and 138 positions including EIS preparation are requested of which $9,513,600 are for contrats for information services, use analyses, scientific exposure/hazard assessment and risk/benefit and site/pest information.

This decrease in resources for rebuttable presumptions reflects the reduction of program activity as work is completed on the initial 65 chemical classes first accepted as RPAR candidates. Thirty-five positions and $2.5 million transferred from the Research and Development appropriation for the substitute chemicals program will allow the RPAR program to phase-out more gradually than originally projected resulting in an offsetting reduction of funds.

At this level of resources, final decision documents, including environmental impact statements will be prepared for 20 chemical classes on which a rebuttable presumption has already been declared because they are suspected of having an adverse effect on man or the environment. In addition, decisions on whether to issue an RPAR will be made after data gathering for, and evaluation of, 17 chemical classes. About two administrative hearings are anticipated, for which technical and scientific support will be provided. The substitute chemicals program will be integrated into the RPAR process since final decision documents require the determination of feasible alternative pest control strategies that can be safely and effectively substituted for RPAR chemicals.

In the laboratory audit program, 70 laboratories presently carrying out chronic feeding and other studies on laboratory animals will be audited. This level will also permit evaluation of 200 registrant validations of toxicology studies.

MARKET SAMPLE ANALYSIS

1978 Accomplishments

In 1978, 20 regional positions and $636,600 were devoted to the pesticide market sample analysis program. This program is conducted by four pesticide analysis laboratories located in New York, Mississippi, Colorado, and California. Pesticide product samples are analyzed by the laboratories to determine if the products contain the active ingredients in the amounts claimed on the labels, and if the product contains adulterating chemicals including pesticides not claimed on the label.

1979 Program

In 1979, this program will be transferred to the Enforcement appropriation.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$419,000 results from the transfer of this amount to pesticides enforcement to support market analysis laboratory work at the National Enforcement Investigation Center and pesticides enforcement activity in headquarters.

Abatement and Control

Registration and Tolerances

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Registration.....	$6,513	$7,681	$8,659	$8,250	-$409
Special Registration...	1,766	1,581	2,074	1,621	-453
Tolerances.....	1,049	1,320	1,369	2,319	+950
Total.....	9,328	10,582	12,102	12,190	+88
Permanent Positions					
Registration.....	236	227	227	235	+8
Special Registration...	84	65	71	66	-5
Tolerances.....	76	57	51	60	+9
Total.....	396	349	349	361	+12
Full-time Equivalency					
Registration.....	...	...	243	245	+2
Special Registration...	...	...	86	84	-2
Tolerances.....	...	...	65	67	+2
Total.....	...	...	394	396	+2

Budget Request

A total of $12,189,600 and 361 positions is requested in 1980 for registration and tolerances. The increase of 12 positions is in response to the recent FIFRA amendments which not only permit conditional registrations but also free constraints in the registration process and clear the way for an increased number of registration applications.

Program Description

Major efforts are directed in three areas. First, registration enables new products to enter the market. Under this program, new pesticide products are registered, and current registrations are amended for new uses or new formulations. Registration also provides for classification for general or restricted use. Certain pesticide uses which, if left unclassified, could cause an adverse effect to man or the environment. Registration activity will increase in 1979 and 1980 for two principal reasons, both arising from the recent Amendments to FIFRA: clarification of the trade secret provisions of FIFRA, and implementation of conditional registration. Conditional registration will permit products, especially those containing old active ingredients, to be registered under simplified procedures before a generic standard is developed.

The special registration program covers all activities relating to (a) the issuance of experimental use permits under Section 5 of FIFRA to generate data for registration, (b) the issuance of emergency exemptions under Section 18, and (c) the issuance of Section 24(c) special local need registrations, which are handled largely by the States with Federal oversight.

The tolerances program provides for the establishment of pesticide residue tolerances on food and animal feed crops under the Federal Food, Drug and Cosmetic Act.

REGISTRATION

1978 Accomplishments

In 1978, 236 positions and $6,513,300 were devoted to the registration process, of which $2,095,300 were for contracts for information services, site/pest and quantitive use analyses.

Proposed guidelines on data required to support registration were published in the Federal Register on product chemistry, environmental fate and environmental safety. The site/pest coding process, which computerizes use/site/pest information on registered pesticide labels for rapid access and entry into pesticide information processing systems, was begun on product labels presently on file. EPA anticipates completing this project in the first quarter of 1979. Also, the preparation of regulations for conditional registration was begun in anticipation of the recent passage of the FIFRA amendments and scientific evaluation procedures were reviewed and in some cases changed in order to achieve greater productivity.

The following actions were processed: 3,700 administrative amendments, 1,796 technical amendments, 21 new chemical applications, 2,301 routine registrations, and 24,000 supplemental registrations.

1979 Program

In 1979, $8,659,000 and 227 positions were allocated in anticipation of increased workload resulting from passage of the FIFRA Amendments. Of this amount, $4,391,400 are for contracts for information services, including ADP services to track the influx of new applications, and site/pest information.

Conditional registration of pesticide products will begin, causing the registration process to experience a sharp influx of "me-too" registrations and amendments. It is expected that by the beginning of the third quarter, incoming applications for "me-too" products will exceed 250 per month and amendments 500 per month--more than twice the 1978 rate.

Activity will continue on developing registration data guidelines, on increasing the efficiency of the registration review process and on reducing overall registration decision making time. The Agency expects the following additional actions to be processed over the 1978 workload: 104 more technical amendments, 11 more new chemical applications, and 299 more routine registrations. The number of months required to reach to reach a registration decision on new chemicals/technical amendments will be reduced by 25 percent due to conditional registration and process improvements. Finally, the backlog of scientific reviews for pending new chemical/technical amendment applications will be reduced by 30 percent.

1979 Explanation of Changes from Budget Estimate

The net increase of +$976,900 results from several actions. An increase of +$752,000 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. The increase for pay costs within this element was offset by the transfer of -$106,200 to other Agency activities to support the cost of the most recent pay raise. Finally, as a result of the Agency's ZBB review of resource requirements for its FY 1979 operating plan, +$331,100 was reprogrammed to this element from the agency support program.

1980 Plan

In 1980, 235 positions and $8,249,400 are requested of which $3,831,400 is for information services and site/pest contracts. The increase of eight positions is necessary to deal with greater demand for regulatory decision making in 1980 due to conditional registrations. It is anticipated that the Agency will process 3,700 administrative and 1,900 technical amendments, 32 new chemical applications, 2,600 routine registrations, 740 intrastate product registrations, and 2,820 reregistrations.

The position increase will also reduce regulatory decision making time from 11 months in 1979 to seven months in 1980 and reduce the backlog of new chemical and technical amendment applications by over 50 percent. Decreased funding is possible because basic contracts for conditional registration data will be shifting from start-up to in-place operation.

SPECIAL REGISTRATION

1978 Accomplishments

In 1978, 84 positions and $1,765,900 were expended for the special registration process. No funds were obligated for contracts. Approximately 240 Section 5 experimental use permit applications, 75 temporary tolerance petitions, 180 Section 18 emergency exemption actions and 1,200 Section 24(c) State registrations were reviewed. Support for the minor use program was provided, including reviewing petitions and serving as liaison with minor use interest groups.

1979 Program

The 1979 program requires 71 positions and $2,074,300 including $739,500 for information services/ADP contracts. This will permit Section 5 experimental use permits to be processed within 120 days of receipt and Section 18 emergency expemtions to be finalized within four weeks of receipt. Also, 20 percent of follow-up experimental use permit reports will be evaluated, and increased guidance will be provided to petitioners for minor crop uses.

1979 Explanation of Changes from Budget Estimate

The net increase of +$493,300 results from several actions. A net increase of +$193,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. The increase for pay costs within this element was offset by the transfer of -$20,300 to other Agency activities to cover the cost of the most recent pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$320,300 was reprogrammed to this element from agency support.

1980 Plan

In 1980, 66 positions and $1,621,200 are requested, a decrease of five positions and $453,000 from 1979. The $380,400 in contracts will be used for information and ADP services. Section 18 emergency exemptions will be processed within four weeks of receipt and experimental use permit (EUP) applications and petitions for temporary tolerances will receive scientific and administrative processing within 120 days of receipt. One hundred additional periodic EUP reports will be reviewed plus an additional 50 revised labels which are required as a condition for granting EUP's.

State issued Section 24(c) registrations and Section 5(f) experimental use permits will be reviewed for less obvious discrepancies and necessary corrective action will be taken. Appropriate comments and constructive criticism will be forwarded to the States. Additional revised labels will be reviewed for agreement with the terms of each special registration and a sampling program will be established to evaluate the scientific validity and legal adequacy of data submissions.

TOLERANCES

1978 Accomplishments

In 1978, 76 positions and $1,049,200 were expended in the tolerances process. No funds were obligated for contracts; 135 new petitions (including those for 15 new chemicals), 125 amendments and 60 inert ingredient requests were reviewed to establish residue levels that will protect human health.

The 15 petitions for new chemicals included tolerance requests for two chemicals on cotton to control the cotton bollworm, for which there is presently no means of control. Also, approximately 450 telephone requests and 300 written requests for tolerance information were processed with written response time averaging less than two weeks.

1979 Program

Fifty-one positions and $1,369,100 are allocated to the tolerance program in 1979 of which $410,300 are for information services and hazard assessment contracts. This will permit the review of all requests to establish residue levels and enable the Agency to provide written replies to inquiries on tolerance petitions within an average two weeks time. Raw agricultural commodity and food additive tolerance petitions will be processed in a timely manner.

The Agency will also be able to process 120 new petitions (including those for 15 new chemicals), 100 amendments, and 60 inert ingredient requests. Processing will include administrative handling, coordination of data review, review of data, risk/benefit analysis, and preparation of Federal Register notices.

Also, responses to 300 written and 450 telephone inquiries will be able to provided, including both congressional inquiries and responses to general correspondence on tolerances, inert clearances, etc. Replies will average two weeks turnaround time.

1979 Explanation of Change Budget Estimate

The net increase of +$49,500 results from several actions. An increase of +$66,000 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. This increase was offset by the reprogramming of -$16,500 to other Agency activities for the cost of the most recent pay raise.

1980 Plan

In 1980, 60 positions and $2,319,000 are requested, including $1,191,000 for information services and hazard assessment contracts. An increase of nine positions is due to the expected increase in tolerance petitions resulting from the conditional registration program.

In 1980, 135 tolerance petitions, 125 amendments, and 60 inert ingredient requests will be able to be processed. Timeliness of processing petitions will be improved.

Abatement and Control

Federal and State Program Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Pesticides Use Management.....	$5,740	$2,913	$4,486	$3,706	-$780
Total.....	5,740	2,913	4,486	3,706	-780
Permanent Positions					
Pesticides Use Management.....	61	30	30	39	+9
Total.....	61	30	30	39	+9
Full-time Equivalency					
Pesticide Use Management.....	...	...	63	52	-11
Total.....	...	...	63	52	-11

Budget Request

An appropriation of $3,706,000 and 39 positions is requested in 1980. This reflects a decrease of $780,000 and an increase of nine positions from the 1979 level.

Program Description

EPA is committed to ensuring that State and local governments assume a large responsibility for pesticide control programs. The Agency has been working with States in the implementation of cooperative Federal/State programs, in particular those involving the certification and training of applicators to apply restricted use pesticides. EPA believes that this will not only result in better control of pesticides and fewer accidents but will also be more cost effective and responsive to local need. The States are now extensively implementing these programs. EPA is also working with other Federal agencies and Indian Tribes that apply significant amounts of pesticides in the development of their programs for training and certification. In order to insure necessary continuity, EPA will continue to assist the States, Federal agencies, and Indian Tribes in upgrading existing programs while supporting Federal certification in Colorado and Nebraska where the States have not assumed responsibility. Tribal programs are expected to be much smaller in size than State programs and will require commensurately fewer resources.

The Agency also provides information to the public and industry on activities associated with pesticides registration and conducts activities directed at educating the public on safe use practices. In accord with Section 4(c) of FIFRA, instructional materials on pest management practices, especially integrated pest management (IPM) techniques, have been distributed to the public.

PESTICIDE USE MANAGEMENT

1978 Accomplishments

In 1978, 61 positions and $5,739,500 were expended on pesticide use management activities of which $2,280,000 were for grants to the States for certification and training and $200,000 for IPM studies.

EPA has fully approved a total of 48 State certification plans through 1978. In addition, a Federal agency plan was also approved. Two Federal certification plans (one in Colorado and one in Nebraska) were implemented and planning for Indian certification programs was initiated in eight regions.

By the end of the fiscal year, 88 percent (282,494) of commerical and 79 percent (1,341,000) of private applicators had received initial certification. Also, lists totaling 23 active ingredients, affecting 3,300 uses classified for application only by certified applicators, were published in the Federal Register. This marks the first registry of classified pesticides and implements the full scope of the applicator certification and training program by specifying certain chemicals for applicators' exclusive use.

In addition, the evaluation of the applicator certification and training program was expanded to enough States to permit EPA to begin to draw national inferences from the findings. The Agency also developed and publsihed applicator training manuals on agricultrual plant, regulatory, right-of-way, antimicrobial and wood preservation topics. Training programs entitled "Pesticide Fire and Spill" and "Farm Worker Protection" were developed and distributed for firefighters and health personnel, and a survey of State needs was completed.

The regional pesticide branches, in addition to providing significant support to the certification and training program, were also active in a number of key areas: providing assistance to pesticide manufacturers, formulators, and distributors on all aspects of registration requirements; conducting training for fire departments to handle pesticide fires and spills, and training for health clinic personnel in the treatment of pesticide poisonings; conducting pesticide accident investigations, which resulted in improved data on pesticide accidents and misuse and which will in turn be used to support registration decisions and label changes; providing technical assistance to their counterparts in the water programs to improve pesticide use practices around water; responding to congressional, press, and public requests for information; representing agency policies and programs to all affected governmental and private entities; participating in Interagency Regulatory Liaison Group (IRLG) activities; and providing a significant level of assistance to State and local governments on matters covering the range of agency pesticide regulatory activities.

1979 Program

In 1979, 30 positions and $4,486,000 are available. Of this amount $1,950,000 will be provided to the States for support of certification and training programs. The new amendments provide for a Federal share in the costs (up to 50 percent) of this program. Cooperative agreement type funding arrangements will be used wherein State performance will be closely monitored. Also in 1979, the evaluation of certification and training programs will be expanded to five or six States, $250,000 will be made available for Federal certification programs in Colorado and Nebraska and $56,000 for Indian certification.

The regions will curtail much of their present program activity (e.g., assistance to States and other government entities, health and safety clinics and programs, accident investigations, and self-initiated outreach programs) but will continue to provide assistance to pesticide manufacturers under Section 3 of FIFRA, and will assist States in meeting ongoing certification and training requirements.

1979 Explanation of Changes from Budget Estimate

The net increase of +$1,573,000 results from several actions. An increase of +$331,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. This increase was offset by the transfer of -$39,300 to other agency activities to support the costs of the most recent pay raise. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$1,281,000 was reprogrammed to this activity from new source permit EIS preparation ($650,600) and Federal activities EIS review ($188,700) within the interdisciplinary media and from toxics management ($81,600) and program support ($360,100).

1980 Plan

In 1980, 39 positions and $3,706,000 are requested, of which $1,978,200 are extramural funds for applicator training and certification programs ($1,672,200 for State programs, $250,000 for Federal programs in Colorado and Nebraska, and $56,000 for Indian certification). Headquarters will continue to appraise Integrated Pest Management techniques using the contract mechanism. RPAR and special registration review functions will be preformed at headquarters. Registrant/public inquiries and problems with these programs will be directed to the regions.

Regions will undertake a moderate level of activity in the areas of assistance to States and other government entities and health and safety outreach. They will also continue responding to registrant requests for information and assisting States in the maintenance and upgrading of certification and training programs.

Enforcement

PESTICIDES

Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Pesticides Enforcement.....	$10,068	.$12,363	$13,314	$12,156	-$1,158
Permanent Position					
Pesticides Enforcement.....	146	143	146	116	-30
Full-Time Equivalency					
Pesticides Enforcement.....			168	124	-44

Budget Request

A total of $12,156,000 and 116 positions is requested for the 1980 pesticides enforcement program. This request reflects a decrease of 30 positions and $1,158,000, indicating a lessened demand for Federal activity resulting from increased State activity under the grant program.

Program Description

The EPA pesticides enforcement program, covering approximately 8,000 firms involved in the production of pesticides sold and distributed in the U.S. and millions of persons using those pesticides, is administered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. The first priority of the program is initiating enforcement actions in emergency situations involving substantial threats to public health and safety. The program also emphasizes compliance on the part of the pesticide industry with registration, classification, and labeling requirements, and compliance by the users and applicators of pesticides in observing proper label directions for use. As a result of Federal/State enforcement agreements, the program is conducted largely by cooperating State agencies. Included in the overall program are: observation of pesticide applications; sampling and label checks of pesticides at production sites and in the marketplace; registration of pesticide producing establishments; and initiation of enforcement actions including civil penalties, criminal prosecutions, seizures, stop sales, and injunctive actions.

The primary feature of the program has become State agency cooperation in enforcement efforts. With State participation, the breadth and effectiveness of the enforcement program will be greatly enhanced. These agreements are developed pursuant to the authority of Section 23(a)(1) of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended.

1978 Accomplishments

In 1978, the Agency developed cooperative enforcement grants-in-aid 34 States. Under these agreements, States conducted 1865 use and reentry inspections and 960 inspections of pesticide producing establishments.

During 1978, the following approximate accomplishments were realized by EPA: inspections of 1078 pesticide producing establishments; 1080 use and reentry inspections; 394 inspections at ports of entry; and 1450 marketplace inspections. As a result of these efforts, the following actions were taken: 216 civil actions for product/producer/use violations; 556 Section 9 notices of warning for product/producer violations; and 174 stop sale, use, or removal orders. The Agency also participated

in six investigations of incidents of alleged falsification of data submitted in support of product registration; and published Notices of Judgment, detailing the legal disposition of those civil and criminal actions instituted under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended.

Total resources for this program in 1978 were 146 positions and $10,068,000. Of that total, $291,000 was obligated for contracts for an evaluation of the effectiveness of the State grant program, training for the laboratory inspection, and ADP support, and $5,000,000 for the support of 34 State cooperative enforcement grants.

1979 Program

The 1979 pesticides enforcement program will have as its first priority at both headquarters and in the regions the initiation of enforcement actions in emergencies involving substantial threats to public health and safety. Other programwide responsibilities include emphasis upon enforcement of pesticide use and application, improvement of enforcement methods through greater cooperation with States, and an emphasis upon development of cases of national or regional significance. Additional important activities, including establishment of cooperative enforcement grants with States, will be continued. The grants will provide for participation by approximately 43 States in all areas of pesticides enforcement. The 1979 planned resource level for this program is $13,314,000 and 146 positions, of which $8,800,000 will be used to fund State grants. The pesticides enforcement program, as in previous years, will be directed toward the objectives of ensuring user compliance with label directions for use, and ensuring product and producer compliance with registration, classification, and labeling requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Additionally, contract funds in the amount of $256,000 will be used to obtain data to support enforcement actions; specialized training for pesticides enforcement personnel in the laboratory inspection program; and ADP support.

Federal pesticides enforcement activities will be focused upon those States not participating in the grant program and those States having programs which do not adequately address certain enforcement concerns, within resource limits. User compliance activities will include 540 use and experimental use inspections. Product and producer compliance activities will include about 70 establishment inspections, 110 marketplace inspections, and 115 port inspections.

1979 Explanation of Changes from Budget Estimate

The net increase of +$951,000 results from several actions. First, an increase of +$377,800 is due to increased pay costs from the October, 1978 (FY 1979) pay raise and distribution of the October, 1977 (FY 1978) pay raise. Second, +$419,000 was transferred to this element from Abatement and Control pesticides activity to support pesticides sample analysis activity within the Enforcement appropriation. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$154,200 was reprogrammed to this activity within regions and is attributed to regional reductions in toxic substances enforcement activity.

The 1980 budget for this activity is $12,156,000 and 116 positions; these figures represent decreases of $1,158,000 and 30 positions. Of the total budget, about is available $9,200,000 is available for the support of 43 or more State cooperative enforcement grants. Contract funds will be approximately $210,000, with ADP support and specialized training for pesticides enforcement personnel in performing laboratory data inspections and subsequent enforcement case development as important items.

In 1980, the pesticides enforcement program has as its first priority the initiation of enforcement actions in emergencies involving substantial threats to public health and safety. Emphasis will also be placed upon enforcement of pesticides use and application, improvement of enforcement methods through greater cooperation with States, and an emphasis upon the development of cases of national or regional significance.

in six investigations of incidents of alleged falsification of data submitted in support of product registration; and published Notices of Judgment, detailing the legal disposition of those civil and criminal actions instituted under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended.

Total resources for this program in 1978 were 146 positions and $10,068,000. Of that total, $291,000 was obligated for contracts for an evaluation of the effectiveness of the State grant program, training for the laboratory inspection, and ADP support, and $5,000,000 for the support of 34 State cooperative enforcement grants.

1979 Program

The 1979 pesticides enforcement program will have as its first priority at both headquarters and in the regions the initiation of enforcement actions in emergencies involving substantial threats to public health and safety. Other programwide responsibilities include emphasis upon enforcement of pesticide use and application, improvement of enforcement methods through greater cooperation with States, and an emphasis upon development of cases of national or regional significance. Additional important activities, including establishment of cooperative enforcement grants with States, will be continued. The grants will provide for participation by approximately 43 States in all areas of pesticides enforcement. The 1979 planned resource level for this program is $13,314,000 and 146 positions, of which $8,800,000 will be used to fund State grants. The pesticides enforcement program, as in previous years, will be directed toward the objectives of ensuring user compliance with label directions for use, and ensuring product and producer compliance with registration, classification, and labeling requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Additionally, contract funds in the amount of $256,000 will be used to obtain data to support enforcement actions; specialized training for pesticides enforcement personnel in the laboratory inspection program; and ADP support.

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The net increase of +$951,000 results from several actions. First, an increase of +$377,800 is due to increased pay costs from the October, 1978 (1979) pay raise and distribution of the October, 1977 (1978) pay raise. Second, +$419,000 was transferred to this element from Abatement and Control pesticides activity to support pesticides sample analysis activity within the Enforcement appropriation. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$154,200 was reprogrammed to this activity within regions and is attributed to regional reductions in toxic substances enforcement activity.

1980 Plan

The 1980 budget for this activity is $12,156,000 and 116 positions; these figures represent decreases of $1,158,000 and 30 positions. Of the total budget, about $9,200,000 is available for the support of 43 or more State cooperative enforcement grants. Contract funds will be approximately $210,000, with ADP support and specialized training for pesticides enforcement personnel in performing laboratory data inspections and subsequent enforcement case development as important items.

In 1980, the pesticides enforcement program has as its first priority the initiation of enforcement actions in emergencies involving substantial threats to public health and safety. Emphasis will also be placed upon enforcement of pesticides use and application, improvement of enforcement methods through greater cooperation with States, and an emphasis upon the development of cases of national or regional significance.

In 1980, plans are to include the participation of all or nearly all States and Territories in the grant program. State activities will include use, reentry, and experimental use inspections, establishment inspections and marketplace inspections. As a consequence of this enhanced State role in the overall program, the Federal role will continue to be that of program management, oversight, and training. In States without grants, and in States having programs which do not adequately address certain enforcement concerns, Federal enforcement activities will continue, within resource limits.

Radiation

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase - Decrease - 1980 vs. 1979
		(dollars in thousands)			
Research and Development:					
Appropriation.....	$820	$930	$1,970	$2,930	+$960
Permanent Positions.....	26	26	26	29	+3
Full-time Equivalency...	...	...	31	36	+5
Abatement and Control:					
Appropriation.....	7,726	10,531	8,360	14,271	+5,911
Permanent Positions.....	183	196	179	179	...
Full-time Equivalency...	...	...	218	217	-1
Total, Radiation Program:					
Appropriation.....	8,546	11,461	10,330	17,201	+6,871
Permanent Positions.....	209	222	205	208	+3
Full-time Equivalency....	...	...	249	253	+4
Outlays.....	6,497	5,900	11,100	13,000	+1,900
Authorization Levels.....	830*	*	2,500*	*	

* Funds are currently authorized under the Environmental Research, Development, and Demonstration Authorization Act; this authorization is pending for 1980. Remaining funds are authorized by virtue of the Appropriation Act.

OVERVIEW AND STRATEGY

Exposure to ionizing radiation results principally from naturally occuring sources, some which have been exacerbated through man's intervention in mining and manufacturing processes; from medical and industrial applications of x-ray and radioactive material, and from various aspects of the nuclear power industry. EPA accepts as a prudent public health assumption the concept that any radiation exposure results in some adverse health effects. While some public exposure to radiation is inevitable, no avoidable risk attributable to exposure to radiation should occur to individuals, or to the environment without offsetting benefits.

Exposure to man-made nonionizing radiation (NIR) at radio and microwave frequencies, which were negligible prior to World War II, has increased in both the number and power of NIR sources. This trend is expected to continue. The Agency is therefore expanding its research on the health effects of NIR to ascertain whether increased exposure jeopardizes public health.

EPA has the mandate to protect the public health and environment from any adverse effects related to radiation exposure. Before enactment of the Clear Air Act (August 1977), the two principal authorities for setting radiation standards were (1) the authority transferred from the Atomic Energy Commission under Reorganization Plan #3 of 1970 to establish generally applicable environmental standards for the protection of the population and the general environment from radiation and radioactive materials, and (2) the Federal radiation protection guidance function for Federal activities, as stated in 42 USC 20221 (H).

The Clearn Air Act Amendments of 1977 provide EPA with the ability to regulate radioactive air pollutants through the standard setting authorities of that Act, including National Ambient Air Quality Standards, New Source Performance Standards, and National Emission Standards for Hazardous Air Pollutants. These authoritieis relate to situations in which the public health is or may be endangered. The Uranium Mill Tailings Radiation Control Act of 1978 provides authority for the comprehensive coverage of mill tailings at active and inactive uranium mills, and requires a report and recommendations on any necessary program to eliminate hazards at uranium mills.

Health Service Act, and the National Environmental Policy Act.

These legislative authorities set out a standard setting, environmental assessment, and technology assessment role for EPA. Enforcement responsibilities, with certain exceptions, are set out for other agencies, notably the Nuclear Regulatory Commission. However, EPA does perform some oversight functions to insure that established standards and guidance are followed. Enforcement of drinking water standards and effluent discharge limits in navigable waters is carried out by appropriate EPA offices, as are actions taken under the Clean Air Act of 1977 (except where such action is given to NRC by interagency agreement).

Within the framework of the applicable legislation, the radiation program's strategy is as follows:

- Concentrate the application of assessment and regulatory capabilities in those areas which promise the greatest reduction in potential adverse health effects and environmental impacts from radiation.

- Emphasize EPA's regulatory mission to establish standards for radiation in specific environmental pathways, and where Federal guidelines are used, place emphasis on meaningful interagency participation in both the development and the application of the guidelines.

- Maintain an adequate capability for environmental and technology assessment to quantify the nature of existing and emerging radiation problems and the potential impact of advanced technology still in the planning stages.

- Respond to issues of serious public concern, utilizing EPA's expertise to evaluate these concerns and, if necessary, point out the need to control those situations where the corrective actions required are the responsibility of other agencies.

- Assist in the development of State, local, and Federal plans to respond to emergency situations involving nuclear events or large, unexpected releases of radioactivity.

- Assist the States in developing the capability to respond to radiation problems. The highest priority is placed on providing assistance where the States' need to act is derived from EPA's regulations.

- Employ the extensive research capabilities of the other Federal agencies whenever possible, and augment or complement the existing research when a special need exists or where there is a lack of other Federal effort.

Within this general strategy, activities mandated by the Clean Air Act of 1977 and those associated with specifically mandated radioactive waste management requirements are accorded the highest priority. The emphasis on the Clean Air Act activities is consistent with general public concern over radiation and the existence of a large number of poorly defined and uncontrolled sources which may be emitting radioactive air pollutants. The emphasis on the control of radioactive waste disposal will result in environmentally sound solutions to radioactive waste disposal problems as required by overall Federal Government commitments to energy development.

EPA's research program will continue to focus on the health and ecological effects of nonionizing radiation and will expand both the intramural and extramural components as part of the 1980 public health initiative. Work will support the establishment of guidelines, if indicated, for environmental levels of NIR to which the public is exposed. The major initiative will be directed toward the biological effects from long-term, low level exposures, and the identification of mechanisms of interaction of electromagnetic radiation with biological systems. Studies will be performed to resolve the significant discrepancy in allowable microwave exposure standards between Russia and the United States and to refine microwave dosimetry techniques.

1979 Radiation Program	$10,330
Research and Development This increase is for health effects to support EPA's public health initiative.	+960
Abatement and Control Radiation criteria, standards, and guidelines activity will increase by $4.4 million and monitoring and analysis will increase by $1.5 million.	+5,911
1980 Radiation Program	17,201

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

A total of $17,201,000 is requested in 1980. This request, by appropriation account, is as follows:

Research and Development	$2,930,000
Abatement and Control	14,271,000

This represents an increase of $6,871,000 over the 1979 level. The research and development portion of the increase, $1 million, will primarily support that portion of the Agency's public health initiative which focuses on the identification of a potential health hazard from nonionizing electromagnetic radiation (NEMR) and will support the study of long term, low level NEMR exposure effects. An increase of $4.4 million is due to increased emphasis on the development of standards for alternative disposal methods for various classes of radioactive wastes. An increase of $1.5 million will provide for increased source and area monitoring to define the need for regulations and specific regulatory requirements under the Clean Air Act.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate	$11,461
Congressional increases/decreases:	
Microwave radiation research	+1,000
Reduction in lapse rate	-6
Effect of October 1978 pay raise partial absorption	+165
Proposed October 1978 pay raise supplemental	+124
Distribution of October 1977 pay raise	+274
Headquarters and regional offices reprogramming	-2,688
Current 1979 estimate	10,330

Congressional changes to the radiation media include an increase of $1 million for microwave radiation research and a reduction of $6,000 as a result of the $2 million reduction applied to the Abatement and Control appropriation for the lapse rate in the filling of positions.

Headquarters and regional office reprogrammings result in a net change of -$2,688,000, resulting from the "payback" to the water quality media, Section 208 areawide waste treatment management (-$3 million); an increase from the air program (+$325,000); and a transfer to the program management activity (-$13,000).

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations	$8,546	$10,976
Effect of congressional changes	+1,000	...
Effect of October 1978 pay raise	+300	...
Effect of reprogramming	-2,600	...
Program increases	+3,505	+6,000
Change in amount of carryover funds available	+1,249	-646
Change in rate of obligations	-1,024	...
Total estimated obligations	10,976	16,330
(From new obligation authority)	(10,330)	(16,330)
(From prior year funds)	(646)	...

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

Congressional changes discussed in the previous section are expected to result in an increase to obligations of $1 million. The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $300,000. The effect of all reprogrammings is a decrease of $2.6 million.

The increase in budget authority over the 1978 level is expected to result in an increase of $3,505,000 to 1979 obligations; the program changes requested in 1980 are expected to increase obligations by $6 million.

The amount of carryover funds to be obligated in 1979 is $646,000, an increase of $1,249,000 over the 1978 level. In 1980, it is estimated that no carryover funds will be obligated, a decrease of $646,000 from the 1979 level.

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -	Page
			(dollars in thousands)			
Appropriation						
Health and Ecological Effects	$820	$930	$1,970	$2,930	+ $960	R-6
Permanent Positions						
Health and Ecological Effects 1/	26	26	26	29	+3	
Full-time Equivalency						
Health and Ecological Effects	[illegible]	...	31	36	+5	

Purpose

The establishment of guidelines for permissible environmental levels of radiation to which the public may be exposed is an EPA responsibility. Reorganization Plan No. 3 of 1970 transferred all functions of the Federal Radiation Council to EPA. It also transferred to the Administrator the authority, under provisions of the Public Health Service Act, as amended in 1970, to conduct research to provide the scientific data base needed for the formulation of radiation standards. In addition, because of great concern about the potential biological hazards of non-ionizing electromagnetic radiation (NEMR), a multiagency program is coordinated by the Office of Telecommunications Policy, Department of Commerce, to assess the effects of non-ionizing radiation. EPA has been assigned the responsibility of conducting research on health effects associated with various NEMR frequencies.

1/ These figures do not include reimbursable positions associated with the off-site monitoring program. The ORD reimbursable program is the result of a long standing agreement between EPA and the Department of Energy (DOE) to provide monitoring services to the DOE in response to specific DOE requirements and programs at and around the Nevada Test Site.

Research and Development

Health and Ecological Effects

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Health Effects	$820	$930	$1,970	$2,930	+ $960
Permanent Positions					
Health Effects	26	26	26	29	+3
Full-time Equivalency					
Health Effects	...	...	31	36	+5

Budget Request

The budget request for 1980 is $2,930,000 and 29 positions. This represents an increase of $959,600 and three positions over the 1979 budget. This increase will support that portion of the Agency's public health initiative which focuses on the identification of a potential health hazard from NEMR. This will be done through expanded animal testing and epidemiological validation. This increase will also be used to emphasize the study of long-term, low-level NEMR exposure effects on neurophysiologic, teratogenic, immunologic, and cytogenic responses; and will permit the update and evaluation of Eastern and Western literature on biological effects from non-ionizing radiation exposures.

Program Description

In FY 1977 in response to increasing public concern about widespread exposure to NEMR, EPA initiated a small health effects research program to explore this relatively new, growing, and complex source of pollution. The program of studies in non-ionizing radiation now focuses on the potential biological effects of exposure to electromagnetic radiation, as shown through toxicological investigations, and on the mechanisms of interaction of NEMR, including frequency dependence, with biological and biochemical systems. This program accounts for 15 percent of the total Federal effort in non-ionizing radiation research and is the largest intramural effort in this field in the United States.

1978 Accomplishments

In 1978, the radiation research and development program resources were $820,600 and 26 positions. Of this amount, $22,700 was spent on grants and $56,000 on contracts. Major accomplishments of the program include:

- Completion of a multidisciplinary evaluation of the effects of 100 megghertz (FM radio), exposure in rats which were exposed pre and post natally for 90 days. Results showed no measurable differences between controls and experimental animals with regard to growth, development, immunology, and hematology.

-completion of a long-term (90 days) study on dominant recent effects from exposure to 425 megahertz and 2450 megahertz showed no mutation effects.

1979 Program

The 1979 resource level for health effects research is $1,970,400 and 26 positions. Approximately $164,000 will be spent for grants and $630,000 for contracts.

Investigations are continuing on the health effects of non-ionizing radiation from environmental sources such as television, radio, and rada transmissions. Emphasis has been placed on chronic, low-level exposures using low power densities in the range of 5-10 microwatts per square centimeter. The health effects being investigated include: neurophysiologic and behavioral responses to repeated exposure from low-level environmental NEMR (microwaves, UHF, FM, diathermy, L-band radar); chronic low level exposure effects of radio and radar frequencies on immunologic teratogenic and mutagenic respones; microwave dosimetry in biological systems; determination of specific absorption frequencies in biological systems; interactions of amplitude-modulated NEMR with biological systems; and radio and radar frequency interactions on biological systems in vitro. Studies have also been undertaken to conduct a survey of the Eastern European literature on microwave effects research and, through the National Academy of Sciences, to update the evaluation of Western literature on biological effects from NEMR exposure.

1979 Explanation of Changes from Budget Estimate

The net increase of +$1,040,400 results from several actions. Congress provided an add-on of +$1,000,000 for microwave radiation research, and a net increase of +$40,400 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise.

1980 Plan

In 1980, $2,930,000 and 29 positions are requested. This includes $314,400 for grants and $1,257,600 for contracts. This increase of $959,600 and three positions will support the Agency's comprehensive public health initiative. This net increase is a result of a $2,000,000 increase to support the public health initiative and a reduction of the FY 1979 add-ons that are not carried forward.

The 1980 base program will allow continuing studies on the health effects of repeated low level exposures, especially for power densities less than 5 microwatts per square centimeter. Sensitive parameters of effect are teratologic, immunologic, and mutagenic responses, as well as neurophysiologic and behavorial responses. Dose absorption, distribution, and thermographics will be mesured and analyzed. In addition, determinations will be made as to whether power density windows occur for given frequencies, and the resultant health effects of such spikes in a range of frequencies will be analyzed.

The 1980 public health initiative provides a stable research environment in which to conduct long-term studies. These studies will include laboratory experiments with animals to identify the most affected biological system which will be complemented by epidemiological studies could not be accomplished prior to public health initiative. The initiative also provides for research on the identification of mechanisms through which non-ionizing electromagnetic radiation interacts with biological systems. This is a critical unknown and an area which without the initiative cannot be adequately addressed. Additionally, the initiative will expand monitoring and assessment capabilities which will significantly increase our knowledge of the ambient radio frequency environment to which the general population is exposed.

Abatement and Control

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
			(dollars in thousands)			
Appropriation						
Radiation Criteria, Standards, and Guidelines	$2,074	$3,149	$2,529	$6,950	+$4,421	R-10
Environmental Impact Assessment.....	4,639	6,310	4,847	6,312	+1,465	R-12
Radiation Program Implementation.....	1,013	1,072	984	1,009	+25	R-15
Total.....	7,726	10,531	8,360	14,271	+5,911	
Permanent Positions						
Radiation Criteria, Standards, and Guidelines	44	66	66	66	...	
Environmental Impact Assessment.....	111	99	96	96	...	
Radiation Program Implementation.....	28	31	17	17	...	
Total.....	183	196	179	179	...	
Full-time Equivalency						
Radiation Criteria, Standards, and Guidelines	...	...	77	77	...	
Environmental Impact Assessment.....	...	...	114	114	...	
Radiation Program Implementation.....	...	...	27	26	-1	
Total.....	...	...	218	217	-1	

Purpose

The radiation program's abatement and control activities concentrate primarily on the establishment of specific criteria and standards for environmental radiation protection programs. Complementing the criteria and standards setting effort, EPA conducts programs of surveillance and monitoring to determine levels of environmental radiation; reviews federally supported or licensed projects which may be sources of environmental radiation; and provides technical assistance to other governmental agencies.

The principal objective of the radiation abatement and control program is to eliminate unnecessary potential health effects by minimizing exposure to radiation sources. This goal will be attained through environmental monitoring, risk assessments and, when necessary, by establishing standards, criteria and guidance to minimize risk in a cost-effective manner.

Activities in this subactivity are related to the development of environmental standards and Federal radiation guidelines for protection of the public health and the environment from radiation exposures from nuclear energy applications, naturally occurring radioactive materials, medical and occupational radiation and nonionizing radiation.

Environmental Impact Assessment

This subactivity includes environmental impact assessment activities related to the collection of information and the evaluation of public health and environmental impact from both ionizing and nonionizing radiation sources. Technical information is gathered from monitoring the ambient environment as well as through special field studies to determine levels of radiation and present and potential population and environmental exposures. This technical information provides a base of knowledge from which substantive reviews of environmental impact statements are performed and from which decisions are made related to setting required standards, guidelines or general criteria. The monitoring activity also aids in determining conformance with EPA standards. State radiation control programs are supported through the provision of consultation services, laboratory analysis and assistance on specific problems.

Radiation Program Implementation

This subactivity includes activities related to providing support to States in the implementation of their radiation control programs. It also includes the review of environmental impact statements for existing technologies and assistance to States and other Federal agencies on specific environmental problems and radiation control actions.

Radiation Criteria, Standards, and Guidelines

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Environmental Standards and Guidelines.....	$2,074	$3,149	$2,529	$6,950	+$4,421
Total.....	2,074	3,149	2,529	6,950	+4,421
Permanent Positions					
Environmental Standards and Guidelines.....	44	66	66	66	...
Total.....	44	66	66	66	...
Full-time Equivalency					
Environmental Standards and Guidelines.....	...	...	77	77	...
Total.....	...	...	77	77	...

Budget Request

The resources requested are 66 positions and $6,949,600. This reflects an increase of $4,420,900 due to increased emphasis on development of standards for alternative disposal methods for various classes of radioactive wastes.

Program Description

Environmental standards and guidelines are developed and promulgated under this subactivity. These standards and guidelines protect the public health and the environment by minimizing risk from radiation exposures from nuclear energy applications, naturally occurring radioactive materials, medical and occupational radiation exposure and nonionizing radiation.

ENVIRONMENTAL STANDARDS AND GUIDELINES

1978 Accomplishments

Fiscal year 1978 resources included approximately $702,000 in contract support. In 1978, criteria were proposed for the disposal of radioactive waste. Federal guidelines were proposed for cleanup of plutonium contaminated soils. Guidelines were promulgated for protection from radiation in the use of diagnostic X-rays in cooperation with HEW. Population exposure documentation was completed for a determination of the need for guidance for the control of general population exposures to nonionizing radiation.

1979 Program

The work on criteria standards and guidelines has been allocated $2.5 million and 66 positions. These resources include an estimated $400,000 in contract funds. These resources will provide for completion of the Clean Air Act determination and listing of radioactive pollutants which may endanger public health. Work will begin on any necessary regulations for control of such pollutants. Criteria for disposal of radioactive waste and guidelines for clean-up of plutonium-contaminated soils will be promulgated, and a protective action guide for airborne materials will be published. Standards for the disposal of high level radioactive wastes will also be proposed. Final recommendations for protection from exposure to radiation associated with Florida phosphate related land will be published. Standards development for regulation of uranium milling wastes will be initiated pursuant to the Uranium Mill Tailings Radiation Control Act of 1978. Other work underway includes development of guidance for occupational exposure and for nonionizing radiation. The need for environmental standards for release of carbon-14 (which may be covered under the Clean Air Act) will also be examined.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$620,900 results from several actions. Congress applied a $3 million reduction for position lapse rate in the Abatement and Control and Enforcement appropriation; the decrease applicable to this activity was -$6,400. A net increase of +$179,700 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, -$1,200,000 was transferred to areawide waste treatment management resources/Section 208 as pay back for funds borrowed in 1978. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$405,800 was reprogrammed to this element from radiation program implementation ($80,900) and from ambient air quality monitoring ($324,900) within the air media.

1980 Plan

The 1980 plan for this program element includes $6.9 million and 66 positions, including approximately $4.6 million in contract funds. In 1980, actions required by the Clean Air Act and those specifically mandated requirements related to the disposal of radioactive wastes are given the highest priority. Standards will be promulgated as required to cover the most important sources of airborne radiation. Potential sources include uranium cycle facilities; DOE and DOD facilities; and phosphate mines and plants. Alternate methods and strategies for the control of radon will be investigated. Final high level waste criteria and standards will be published. Follow-up consultation and assistance will be given on implementation of previously published regulations (plutonium clean-up, drinking water, residential exposure to radon). A report and recommendations detailing the program necessary to eliminate hazards at uranium mines will be developed under the provision of the Uranium Mill Tailings Radiation Control Act of 1978. In addition, environmental standards will be promulgated for mill tailings at active and inactive uranium mill sites under the Act. Final action will be taken in standards for nonionizing radition, high level wastes, and a standard for carbon-14 (if needed).

Abatement and Control

Environmental Impact Assessment

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Monitoring and Analysis.....	$2,629	$4,009	$1,890	$3,372	$1,482
Technology Assessment.....	2,010	2,301	2,957	2,940	-17
Total.....	4,639	6,310	4,847	6,312	+1,465
Permanent Positions					
Monitoring and Analysis.....	60	61	58	58	--
Technology Assessment.....	51	38	38	38	--
Total.....	111	99	96	96	--
Full-time Equivalency					
Monitoring and Analysis.....	- -	- -	67	67	---
Technology Assessment.....	---	---	47	47	---
Total.....	---	---	114	114	---

Budget Request

The resources requested for this budget subactivity are 96 positions, and $6,312,600. This reflects an increase of $1,465,800 from 1979 for increased source and area monitoring to define the need for regulations and specific regulatory requirements under the Clean Air Act.

Program Description

The activities in this area provide the information necessary to identify and analyze potential radiological health problems having public health impact and to support the development of standards and guidelines. Review of environmental impact statements, monitoring of environmental radiation and laboratory analysis, data analysis and technology assessment are encompassed under this subactivity.

Monitoring and Analysis

This program encompasses activities related to identifying and analyzing radiation problems for potential control by standards and guidelines, supporting technical review of EIS's, assessing the radiological quality of the environment, and providing information on which to base public health protection actions during nuclear incidents. It also includes environmental monitoring, laboratory analysis of environmental samples, development of monitoring and analytical procedures, special monitoring studies and evaluation of data and preparation of resulting reports on a periodic basis.

This program includes activities related to: (1) the engineering assessment of the impact of developing radiation technology on environmental radiation levels to provide a sound technological basis for EIS review and a base of data and information for setting technologically feasible standards and guidelines; and (2) the review of and comment on generic and programmatic environmental impact statements of the design, construction and operation of facilities licensed or operated by other Federal agencies to assure the public that other Federal agencies are fully implementing the National Environmental Policy Act process. This also included EPA responsibilities in assessing Federal facilities radiation control activities.

MONITORING AND ANALYSIS

1978 Accomplishments

In 1978, resources included approximately $877,000 in contract support. Field studies and evaluations were initiated to provide definitive information on a variety of sources and radioactive substances which might be subject to regulation under the Clean Air Act. Specific sources studied included coal fired electric generating plants, uranium mining, nonuranium mining (zinc, iron, phosphates, limestone and others). Investigations were also continued on radon, on the environmental problems associated with radioactive elements in uranium mill tailing piles and on methods of stabilization of such piles. The Environmental Radiation Ambient Monitoring System (ERAMS) was operated and the third annual Report on Radiological Quality of the Environment was published.

1979 Program

Work on monitoring and analysis has been allocated $1.9 million and 58 positions. These resources include no contract funds. Ongoing studies from 1978 will be continued to further define the need for regulation under the Clean Air Act. Additional studies of radiopharmaceutical manufacturers, mineral extraction industries and geothermal power sources will be undertaken for the same purpose. Investigations of uranium mill tailings will continue. The Environmental Radiation Ambient Monitoring System will continue to be operated and associated reports published. Publication of the Radiological Quality of the Environment report will be shifted to a contractual basis as a result of reprogramming positions from the radiation media. Collection of data on radon levels will also be continued, and a decision made on the regulatory mechanisms to be used to control this problem.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$2,119,100 results from several actions. An increase of +$180,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$1,074,400 was reprogrammed from this activity to radiation technology and environmental assessment and -$1,225,000 was transferred from this element to areawide waste treatment management resources/Section 208 as pay back for funds borrowed in 1978.

1980 Plan

The 1980 plan for this program element includes $3.4 million and 58 positions, including $1.4 million in contract funds. This represents and increase of $1.5 million from the 1979 level. In 1980, the Environmental Radiation Ambient Monitoring System (ERAMS) will be operated at the current level to provide data on radiation in air, water, and milk pathways and as an alert mechanism to unusually high levels of radiation. Laboratory analysis will be performed to support the network as will special field studies of environmental problems. Models will be developed to allow predictions of the pathways radioactive substances can travel from sources to humans. Improved methods for data analysis will be developed and utilized. The annual report "Radiological Quality of the Environment" will continue to be published on a contractual basis.

in the vicinity of those sources will be carried out to provide a data base for Clean Air Act regulations to be published in 1980 and beyond. Implementation guides will be developed for radiation portions of the drinking water standard and the plutonium land developed for radiation portions of the drinking water standard and the plutonium land clean-up guidance. Data will be collected on extremely high voltage transmission line radiation to develop guidance to limit exposure to health effects from this source of nonionizing radiation.

TECHNOLOGY ASSESSMENT

1978 Accomplishments

In 1978, resources included approximately $776,000 in contract support. Studies were initiated to examine the control technology available to manage radioactive sources under the provisions of the Clean Air Act. Assessment of problems associated with shallow land burial of low level waste continued. A report of studies of ocean dumping of low level waste was developed and is currently in the printing process. EIS related reviews were completed on 20 items related to generic concepts and advanced nuclear technology. Evaluations were completed on problems relating to decommissioning of nuclear facilities and are continuing on the siting of such facilities.

1979 Program

The work on technology assessment has been allocated $3.0 million and 38 positions, including $1.9 million in contract support. These resources include continuation of technical feasibility studies of managing radioactive pollutants which might be regulated under the Clean Air Act. Studies will continue on shallow land burial sites for low level waste disposal. Reports will be published on two previously studied shallow land burial sites and on ocean disposal of low level wastes. Development will begin on criteria for ocean disposal site selection, monitoring, and waste packaging. Generic EIS's will be reviewed and commented on as required.

1979 Explanation of Changes from Budget Estimate

The net increase of $655,900 results from several actions. A net increase of +$103,400 results from increased pay costs from the October 1978(1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$1,140,100 was reprogrammed to this element from radiation program implementation ($65,700) and radiation monitoring and analysis ($1,074,400) elements to Abatement and Control program management ($12,600), and to areawide waste treatment management resources/Section 208 ($575,000) within the water quality media as pay back for funds borrowed in 1978.

1980 Plan

The 1980 plan for this program includes $3 million and 38 positions, including $1.6 million for contract support. The 1980 program will provide States and regional offices with an air cleaning systems manual for use during inspection of facilities to determine compliance with CAA standards in 1981. Field experiments will be conducted at two existing shallow land burial sites located in different climatic and geological regimes. This data will be used to further develop and validate predictive models for the transport of radionuclides from such sites. The data and its applications are crucial parts of the technical support documentation for criteria and standards for disposal of such wastes. Site selection criteria and monitoring requirements will continue to be developed for ocean disposal of low level wastes. A risk analysis will be completed for higher probability -- lower consequence nuclear accidents and the review of environmental impact statements will continue.

Abatement and Control

Radiation Program Implementation

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
State Program Support.....	$361	$410	$423	$410	-$13
Regional Program Implementation.....	652	662	561	599	+38
Total.....	1,013	1,072	984	1,009	+25
Permanent Positions					
State Program Support.....	10	10	5	5	...
Regional Program Implementation.....	18	21	12	12	...
Total.....	28	31	17	17	...
Full-time Equivalency					
State Program Support.....	...	...	8	8	...
Regional Program Implementation.....	...	...	19	18	-1
Total.....	...	...	27	26	-1

Budget Request

The resources requested for this budget subactivity are 17 positions and $1,009,000. This reflects a slight increase of $24,600 for contract support.

Program Description

Through this program, EPA assists the States and regions with laboratory support for special analyses, emergency response planning assistance, and investigations of unplanned radiological incidents of national and State concern. As a service, a repository is provided and maintained for disposal of radium sources. Other Federal agencies are assisted with investigations, analyses, and evaluations of radiation problems beyond their normal capabilities. The activities further the attainment of the overall program objective of minimizing unnecessary exposure to radiation by appropriate expertise of equipment to obtain necessary environmental information on a problem.

State Program Support

The program element includes activities related to providing States and other Federal agencies with laboratory support for special analyses, investigations of unplanned radiological incidents of national and State concern, and a service for the disposal of radium sources. It also includes assisting other Federal agencies with investigations, analyses, and evaluations of radiation problems beyond their normal capabilities.

Regional Radation Program Implementation

This program includes activitites related to EPA's regional offices' review of the routine environmental impact statments (e.g., for light water reactors and uranium mining and milling). Additional activities include providing the public with technical information and direct assistance to State and local government with special radiation problems of a short term nature and in emergency response planning.

STATE PROGRAM SUPPORT

1978 Accomplishments

In 1978, resources included no contract support. In 1978 approximately 70 percent of the priority requests of States and regional offices for special analysis of radioisotopes were met. A limited number of requests for special field investigations were responded to, generally in instances where the urgency or possible application of the resulting data on national problems dictated the decision to respond. Examples were an investigation of potential radon exposures resulting from the use of phosphate slag in building foundations and parking lots in Wyoming and Montana and the investigation of suspected health effects from nonionizing radiation in Eugene, Oregon. A collection and repository service for radium sources was provided and maintained. Participation in interagency programs for emergency response planning and for training and testing of plans was continued.

1979 Program

The work on State program support has been allocated $423,000 and five positions. These resources include an estimated $100,000 in contract funds. The resources will enable analytical support to State programs to be maintained at the 1978 level, principally through the use of contracts. A limited number of special investigations will be carried out, such as the completion of a phosphate environmental surveillance report for the State of Idaho. Participation in interagency programs for emergency response planning, training, and testing of plans will continue at a reduced level. The collection and repository service for radium sources will continue at Montgomery, Alabama.

1979 Explanation of Changes from Budget Estimate

The net increase of +$12,900 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise.

1980 Plan

The 1980 plan for this program includes $410,000 and five positions, including $100,000 in contract funds.

The 1980 program calls for the provision of special expertise and equipment to assist States, regional offices, and other Federal agencies in solving special radiation problems. This will include providing limited support for the investigation of unplanned environmental radiation events of interest to the National radiological control effort; assisting States with emergency response planning; and development of a public awareness activity for the Office of Radiation program. Laboratory analytical services will continue to be provided to States. However, a majority of this effort will be provided through contract services instead of in-house personnel. The collection and repository service for radium sources will be continued.

1978 Accomplishments

In 1978, resources included no contract support. Accomplishments in 1978 included the review of 48 draft and final EIS's by the regional offices. These generally related to conventional light water reactors and uranium mining and milling. Assistance was provided to State and local agencies in strengthening their programs. Technical and general information was provided to the public on a request basis. Other activities which varied by region included assistance to the water program on radionuclides in drinking water and investigations of special problems, such as uranium mill tailings on Indian lands.

1979 Program

The work on regional program implementation has been allocated $562,000 and 12 positions. These resources provide for the review of approximately 58 draft and final EIS's. The level of assistance to State and local agencies in most regions will be maintained at about the 1978 level. Assistance to the water program and special investigations are being carried out selectively at about the 1978 level.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$100,200 results from several actions. A net increase of +$46,400 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. Finally, as a result of the Agency's ZBB review of resource requirements for the 1979 operating plan, -$146,600 was reprogrammed from this element to environmental standards ($80,900) and technology and environmental assessment ($65,700).

1980 Plan

The 1980 plan for this program includes $599,000 and 12 positions. This includes a small amount of contracts. This will provide for the regional review of environmental impact statements, consultation with State agencies on emergency response planning, and guidance in the implementation of drinking water standards for radiation.

Noise

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Abatement and Control:					
Appropriation.....	$11,762	$9,767	$10,008	$11,949	+$1,941
Permanent Positions.....	72	75	75	74	-1
Full-time Equivalency.....	...	...	125	139	+14
Enforcement:					
Appropriation.....	1,048	916	1,005	1,004	-1
Permanent Positions.....	22	22	22	23	+1
Full-time Equivalency.....	...	...	38	39	+1
Total, Noise Program:					
Appropriation.....	12,810	10,683	11,013	12,953	+1,940
Permanent Positions.....	94	97	97	97	...
Full-time Equivalency.....	...	...	163	178	+15
Outlays.....	9,400	...	10,530	10,320	-210
Authorization Levels.....	a/	...	19,000	b/	-19,000

a/ Authorization by virtue of Appropriation Act.
b/ Authorization pending.

OVERVIEW AND STRATEGY

Consistent with the policy set forth in the Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978, the overall objective of the noise program is to achieve an environment free from noise which jeopardizes health or welfare. The new Act provides a more effective and efficient approach to noise abatement. In particular, assistance to State and local governments has been strengthened. In addition, the new Act provides for the design and management of a noise health effects program. It also requires that EPA develop and demonstrate technology that is responsive to the needs of State and localities. Under the authorities of the legislation, EPA is required to regulate the noise emissions from new products identified as major sources of noise (other than aircraft). Emission standards may also be set for in-use equipment of interstate motor carriers and in-use equipment and facilities of interstate rail carriers (i.e., on equipment presently in-use). Noisy products and products sold to control noise may be regulated to require labeling and thus aid consumers in product selection. EPA also must provide assistance to State and local governments in developing programs for noise control.

EPA also has the responsibility to coordinate Federal noise related research and control activities. Furthermore, the Act allows EPA to designate products with low noise emissions for preferential Federal purchase, thus bringing added marketplace pressure to bear on the development of quieter equipment.

surface transportation and construction. Fiscal year 1979 should see the promulgation of three noise emission regulations and the proposal of one additional regulation. A general labeling regulation, soon to be promulgated, will provide a basis for informed consumer choices with regard to the noisiness of new products. This program along with preferential Federal purchases of quiet products through the Low Noise Emission Products Program (LNEP) should encourage the design and manufacture of quiet products.

Effective State and local noise control programs are essential if the Nation is to reduce noise to levels commensurate with the protection of public health and welfare. Consequently, EPA conducts a program of technical assistance to both State and local governments. In addition, this program serves as a necessary and essential counterpart to the Federal noise regulatory development program.

The Objective of the State and local assistance program is to substantially increase the number of communities having active programs with emphasis on motor vehicle control (motorcycle, trucks, autos): stationary source control (fence line standards): construction noise control; noise abatement planning (zoining, land use planning); and public information.

The Each Community Helps Other (ECHO) program uses local volunteer noise control experts to assist other communities, with EPA paying out-of-pocket expenses, but not salaries. The Quiet Communities Program experiments are designed to research and demonstrate the best available techniques for noise control in various types of communities.

Fiscal year 1978 saw a renewed emphasis placed upon the coordination of Federal noise research resulting in the publication of four interagency noise research panel reports. Efforts in 1979 are directed toward implementing the panels' recommendations. In 1979 and 1980, EPA will initiate and maintain an expanded health effects investigatory program, with emphasis on nonauditory health effects.

The EPA noise enforcement program is responsible for Federal enforcement of the new product emission standards under Section 6 of the Act and the informational labeling requirements which are applicable to new products under Section 8. The main emphasis of the program in 1980 will be the continued enforcement of the noise emission standards for new portable air compressors and medium and heavy-duty trucks through production verification and selective enforcement audits. Enforcement activities will also include the continued development of enforcement strategies and regulations for other Section 6 and Section 8 products and a minimal level of guidance and assistance to State/local noise enforcement programs. The new Act also reflects an increase in enforcement options in the form of civil penalties [Section 11(a)(2)]--only criminal penalties [Section 11(a)(1)] and remedial orders [Section 11(d)(1)] had been provided for in the past.

SUMMARY OF INCREASES AND DECREASES

	(in thousands of dollars)
1979 Noise Program.....	$11,013
Abatement and Control..... This increase will provide for additional health effects investigation ($45,500) and some additional assistance to States and localities ($1,486,000).	+1,941
Enforcement..... This minimal decrease is due to a realignment of 1980 costs and does not reflect any change in program levels.	-1
1980 Noise Program.....	12,953

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Request

An appropriation of $12,953,000 is requested for 1980. This request appropriation account, is as follows:

Abatement and Control.....	$11,949,000
Enforcement.....	1,004,000

This request represents an increase of $1,940,000 from the 1979 level, reflecting additional funds to provide initial assistance to State and local governments in developing noise control programs.

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.....	$10,683
Effect of October 1978 pay raise partial absorption.....	+67
Proposed October 1978 pay raise supplemental	+58
Annualization of October 1977 pay raise.....	+137
Headquarters and regional offices reprogramming.....	+68
Current 1979 estimate.....	11,013

Pay raise costs result in a total increase of $262,000 over the original estimate. The agency request included all funds for the October 1977 pay raise in the management and support media, to be distributed to other media at a later date. The increase reflected represents the share of this later distribution.

Headquarters and regional office reprogrammings result in a net change of +$68,000. a transfer of $37,000 is made from the air media and $31,000 from the toxic substances media.

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations	$12,810	$11,310
Effect of October 1978 pay raise	+130	...
Effect of reprogrammings	+65	...
Program increase	...	+1,900
Change in amount of carryover funds available	-1,695	-297
Change in rate of obligation	...	...
Total estimated obligations	11,310	12,913
(From new obligation authority	(10,926)	(12,826)
(From prior year funds)	(384)	(87)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $130,000. The effect of all reprogrammings is an increase of $65,000.

The program changes requested in 1980 are expected to increase obligations by $1.9 million.

The amount of carryover funds to be obligated in 1979 is $384,000, a decrease of $1,695,000 from the 1978 level. In 1980, it is estimated that $87,000 of carryover funds will be obligated, a decrease of $297,000 from the 1979 level.

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
PROGRAM LEVELS					
Review production verification reports	935	660	880	880	...
Monitor production verification tests	4	25	15	27	+12
Monitor Selective Enforcement Audit tests	6 a/	21	12	20	+ 8
Conduct production verification tests	...	5	5	8	+ 3
Conduct Selective Enforcement Audit tests	...	1	...	2	+ 2
Inspect manufacturer's records	23	18	18	39	+21
Propose Enforcement regulations	3	...	2	3	+ 1
Promulgate Enforcement regulations	...	...	5	2	- 3
Provide Enforcement Guidance re: State/ local Enforcement procedures	1	...	3	2	- 1
Develop State/local Enforcement procedures	1	...	1	2	+ 1
Conduct site comparison tests	6	10	7	10	+ 3
Number of S/L noise programs that were assisted	20	...	30	5	-25

a/ Includes 2 early SEA's

Abatement and Control

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
			(dollars in thousands)			
Appropriation						
Environmental Noise Strategies and Standards..	$8,691	$5,681	$5,707	$6,162	+$455	N-8
Noise Program Strategies Implementation.....	3,071	4,086	4,301	5,787	+1,486	N-12
Total.....	11,762	9,767	10,008	11,949	+1,941	
Permanent Positions						
Environmental Noise Strategies and Standards..	37	35	35	35	...	
Noise Program Strategies Implementation.....	35	40	40	39	-1	
Total.....	72	75	75	74	-1	
Full-time Equivalency						
Environmental Noise Strategies and Standards..	...	...	48	52	+4	
Noise Program Strategies Implementation.....	...	...	77	87	+10	
Total.....	...	...	125	139	+14	

Purpose

The basic objective of the noise abatement and control program is to promote an environment for all Americans free from noise that jeopardizes their health and welfare. This objective is pursued through four major program thrusts detailed in the Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978. First, State and local noise control efforts are strengthened through the provision of technical assistance and program initiation support; second, emission standards and/or labeling regulations are promulgated on selected products; third, Federal activities relating to noise research and abatement and control are coordinated; and fourth, investigations on noise effects and abatement and control technology are continued.

Noise abatement and control activities include the identification of major sources of noise and the subsequent development of new product emission regulations. These standards are intended to protect the public health and welfare through the application of the best available technology, taking into account the cost of compliance. Labeling regulations are also set for some products which emit noise capable of adversely affecting the public health and welfare. Labeling will also be required for products which are sold on the basis of their effectiveness in reducing noise, such as hearing protectors.

local governments for the development and implementation of noise control programs. Assistance is given to State and local communities to establish in-use enforcement programs for noise sources.

Technical assistance is provided in the form of direct guidance to State and local agencies on how to carry out environmental assessment in order to define noise problems and to other Federal agencies whose programs and activities have noise control implications. Noise abatement and control is characterized under the following subactivities:

Noise Strategies and Standards

This subactivity includes: (1) the establishment of noise emission standards for selected new products; (2) the establishment of noise labeling requirements for new consumer products; (3) the establishment of regulations requiring labeling for noise protection and control devices; (4) general investigations into the human health and welfare effect of noise; (5) coordination of Federal research on noise; and (6) the demonstration of control technologies that are in direct support of regulations.

Noise Program Strategies Implementation

This subactivity includes activities related to the implementation of regulatory requirements for which the Federal Government has primary responsibility (i.e., the control of noise emissions at Federal facilities and review of EIS for their noise impact), and the overall coordination of all Federal programs for noise abatement and control. Also included is headquarters and regional assistance in the development and improvement of State and local noise control programs, including but not limited to consultation with States and localities on specific noise abatement problems, and the provision of support for noise control program initiation, transportation and stationary source planning, and noise control demonstrations.

WATER QUALITY

Abatement and Control

Water Quality Strategies Implementation

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Ocean Disposal Permits	2,617	1,371	1,524	1,231	-293
Regulatory EIS Prep-WQ	340	500	500	500	...
Subtotal.....	2,957	1,871	2,024	1,731	-293
Spill Prevention and Response.....	3,977	7,503	8,358	8,118	-240
Dredge and Fill Regulations.....	848	1,321	4,015	1,723	-2,292
Total.....	7,782	10,695	14,397	11,572	-2,825
Permanent Positions					
Ocean Disposal Permits	32	23	27	25	-2
Regulatory EIS Prep-WQ	...	...	...	...	...
Spill Prevention and Response.....	108	119	119	122	+3
Dredge and Fill Regulations.....	30	34	49	49	...
Total.....	170	176	195	196	+1
Full-time Equivalency					
Ocean Disposal Permits	...	...	36	35	-1
Regulatory EIS Prep-WQ	...	...	...	...	...
Spill Prevention and Response.....	...	...	126	136	+10
Dredge and Fill Regulations.....	...	...	52	61	+9
Total.....	...	...	214	232	+18

Budget Request

The 1980 appropriation request is $11,572,700 and 196 positions. This is a decrease of $2,824,000 and an increase of one position from the current 1979 budget estimate.

Program Description

The water quality strategies implementation subactivity covers the spill prevention and response, ocean disposal permits, and dredge and fill program areas. The program "Federal activities/EIS reviews", previously in this subactivity, is now grouped under under the Interdisciplinary budget activity.

The primary objective of EPA's spill prevention and response program is to protect water quality by preventing spills and minimizing their impact on the environment. Section 311 of the Federal Water Pollution Control Act, as amended, specifies approachs to spill control consisting of response, prevention, and enforcement. Successful implementation of Section 311 depends on the promulgation of key regulations (including the designation of hazardous materials), development of the National Contingency Plan, establishment of spill response mechanisms, and development of an aggressive spill prevention program. EPA shares responsibility for the spill response program with the

actions in navigable waters and the Great Lakes are drawn geographically between inland and costal waters. EPA's position, supported by Section 311, is that a discharger should take actions to remove the spill material; if the violator fails to do so, EPA will undertake cleanup actions with the discharger required to pay for removal costs. To assure that responses are efficient and coordinated, national and regional contingency plans are required which delineate procedures, techniques (chemical uses), and responsibilities of the various Federal, State, and local authorities.

The new Environmental Emergency Response Team, operating under provisions of the National Oil and Hazardous Substances Pollution Contingency Plan, is an important component of the spills response program. Established early in 1979, it provides expertise in handling, cleanup, and disposal of spills of oil and hazardous substances and will be used to augment regional resources whenever required.

Hazardous substances spill response and control is a major new emphasis. Annually, there are an estimated 700-1200 significant spills of the 271 substances designated as hazardous by EPA, which reach navigable waters. The new hazardous substances activity is structured along the same program format as the existing oil spill program. Spills and incidents involving hazardous substances are projected to increase. Without an effective hazardous substances spill prevention program and adequate spill cleanup and control measures, significant environmental damage can be expected.

For budgetary purposes, the ocean disposal program is divided into two program elements: (1) ocean disposal permits program, and (2) regulatory EIS preparation. The ocean disposal program (authorized by the Marine Protection, Research and Sanctuaries Act of 1972 and operational since 1973) has been expanded to include a new Ocean Program Branch to provide EPA with a capability to develop its ocean related policies and activities and to participate in interagency programs that deal with development of ocean resources. This new program will insure that EPA regulations and guidelines will be applied to the significant new and changing activities in the exploration and development of multiple use of open ocean resources. To this end, the program will utilize water quality criteria, effluent guidelines, and new ocean discharge criteria. Major coordination with the ocean impacting programs of other agencies is necessary. To carry out the ocean disposal permitting functions under Title I of the Marine Protection, Research, and Sanctuaries Act of 1972, the Administrator of EPA is authorized to regulate the disposition of all materials except dredged material (which is regulated by the Corps of Engineers). The Act further prohibits the transportation for the purpose of dumping as well as the dumping in ocean water of chemical, biological, and radiological warfare agents and high level radioactive materials.

The purpose of the dredged and fill material regulation program is to protect the Nation's wetlands and navigable waters from environmental damage caused by indiscriminate discharge of dredged or fill material. EPA is responsible for promulgating guidelines, establishing procedures for the technical review of applications for disposal permits received by the Corps, and specifying disposal sites for dredged or fill material. These guidelines are used by the Corps of Engineers and by States with delegated Section 404 permit programs. A significant action in developing final site selection guidelines is the preparation of a procedures and testing manual for the environmental acceptability of dredged or fill material in water.

OCEAN DISPOSAL PERMITS PROGRAM

1978 Accomplishments

In order to develop consistent and effective EPA policy toward protection of the marine environment, the Ocean Program Branch was established to ensure application of EPA's environmental regulatory authority to natural resource development in the open oceans. Significant initiatives undertaken were:

- Development of National Pollutant Discharge Elimination System (NPDES) permit conditions for offshore oil and gas drilling in the sensitive Flower Garden Banks area, Gulf of Mexico.

- Initiation of intra- and interagency coordination for deep seabed mining, offshore oil and gas technology, and ocean thermal energy conversion (OTEC) from which environmental protection guidelines will be developed.

- Provision of technical assistance on NPDES conditions for the Strategic Petroleum Reserve.

- Establishment of National Oceanic and Atmospheric Administration (NOAA)/EPA Interagency Program Coordinating Committee.

- Issuance of approximately 54 permits under the permit program.

- Collection of data on ocean dump sites for EIS preparation.

- Conduct of baseline surveys for site designations on three dump sites.

- Completion of environmental impact statements on two ocean dump sites using contract support provided by the regulatory EIS preparation program element.

- Evaluation of the Biotal Ocean Monitor System for monitoring at dump sites (through a $100,000 contract).

- Conduct of demonstration monitoring programs at the Philadelphia and New York sludge dump sites.

- Participation in the annual London Dumping Convention policy consultation meeting and an intersessional technical meeting to discuss incineration at sea, procedures for settlement of disputes, and identification of other technical issues.

1979 Program

The ocean disposal permits program resource levels are $2,024,000 and 27 positions for 1979, which includes eight positions and related resources for the new Ocean Program Branch. This funding includes $500,000 for contract support for the development of impact statements for ocean disposal site designation. Baseline surveys will be continued on the three sites initiated in 1978. These surveys will be conducted by contract. Environmental impact and site designation activities will carryover into future years. Dredged material site investigations will commence. Of the 141 interim approved sites which must be surveyed and designated, 127 are for disposal of dredged material, which comprises more than 90 percent of all material ocean dumped. One technical intersessional meeting and the annual Consultative Policy Meeting for the London Dumping Convention are planned. The Biotal Ocean Monitor System evaluated in 1978 will be redefined and operational field testing and evaluation continued. In addition, program guidance to the regions will be conducted, operating manuals prepared, and adjudicatory hearings and public hearings will be held.

The new branch will be involved in ocean dumping site EIS preparation, offshore oil and gas and EIS review; technical assistance; an interagency project involving NOAA and the Departments of the Interior (DOI) and State that would use the Flower Garden Banks in the Gulf of Mexico as a model for measuring the environmental effects of oil and gas drilling and production on sensitive environmental underwater areas on the outer continental shelf; an effort involving NOAA and DOI to determine the quality of open ocean waters and the state of marine technology against which conditions will be established for permitting specific ocean-related industrial operations such as ocean thermal energy conversion and deep seabed mining.

1979 Explanation of Changes from Budget Estimates

The net increase of +$153,400 results from several actions. A net increase of +$81,700 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, +$71,700 was reprogrammed to this activity from agency support.

1980 Plan

The ocean disposal permits program resource levels will be $1,731,000 and 25 positions, which represent a reduction of $293,000 and 2 positions below 1979 levels. This level includes $500,000 from the regulatory EIS preparation program element to develop impact statements for ocean disposal site designation. The Ocean Program Branch expects to continue its 1979 program at a reduced level, dealing only with the highest priority activities.

The program expects to concentrate on environmental effects of offshore oil and gas activities with emphasis on special NPDES permit conditions, environmental guidance, and technical assistance. Because of the statutorily required termination of ocean dumping of harmful sewage sludge as well as the termination of all interim permits by the end of 1981, emphasis on overseeing the implementation of alternative disposal practices must continue and increase. Ocean dumping under special permits will continue at present or slightly higher levels as a result of implementation of the Resource Conservation and Recovery Act, the elimination of marginal and unsatisfactory disposal landfills, and an increase in incineration-at-sea applications which will require site designations and monitoring. Probable changes in the International Ocean Dumping Convention will require changes in U.S. ocean dumping criteria within the next few years, particularly in radioactive waste disposal and incineration at sea. The program is responsible for both international negotiation and changing criteria. Ocean disposal site designations utilizing a major 5-year contract, will be increased and accelerated to meet statutory and litigation requirements. Specific activities include:

- Preparation of annual reports for Congress to support the Intergovernmental Maritime Consultative Organization (IMCO).
- Preparation of position papers and technical documents to support the Ocean Dumping Convention (ODC).
- Continuation of an environmental impact statement (EIS) contract to analyze available data on dumpsites and perform additional baseline surveys to result in the designation of two municipal/industrial dumpsites.
- Development of environmental guidelines for one major offshore activity.
- Review of 10 EISs, 10 development plans, and 25 regulations for outer continental shelf lease sales; review of eight EISs for other offshore activities.
- Revision of ocean dumping regulation based on new statutory requirements, changing program needs, and operational experience.
- Revision of the implementation and procedures manuals on dredge/nondredge materials; review of the bioassay manuals based on operational and reserch experience in ocean dumping.

SPILL PREVENTION AND RESPONSE

1978 Accomplishments

The spills program in 1978 responded to 805 inland spills and water related environmental emergencies that required on-scence coordination to monitor or direct clean-up. It also performed over 2,000 oil spill prevention inspections; provided mechanisms for environmental assessments and aerial photo mapping of significant spills and prevention inspections; and prepared necessary technical documents to support hazardous substances position papers for presentation at the Marine

Environment Protection Committee of the Intergovernmental Maritime Consultative Organization.

Priority was given to development of implementation guidelines for hazardous substances spill prevention and response. Four week-long training sessions for EPA/U.S. Coast Guard (USCG) on-scene coordinators were held. Regional plans and procedures for response to hazardous substances were prepared and some were implemented. A major contractual effort to provide technical assistance and personnel to regional spill response teams was begun and an EPA study on environmental emergencies was supported.

Contract funding of approximately $350,000 was used for technical field support for emergency spills. An additional $450,000 was used to fund contractual functions pertaining to the implementation of the hazardous materials program, to expand the management information system, continue oil prevention aerial photo mapping, continue to provide field support for the emergency environmental response unit, and continue the oil prevention program.

Final hazardous substances rules for designation, removability, harmful quantities, and rates of penalty were promulgated under Section 311, as amended by the Clean Water Act of 1977. There followed a civil suit in which the Court enjoined EPA implementation of the regulations. As a result of a further legislative amendment to Section 311, the regulation has been scheduled for repromulgation early in 1979. The program developed the technical approach for the hazardous substances spill prevention regulation; completed the technical approach for the development of the removal and mitigating action hazardous substances regulations; redrafted the oil removal regulation; completed the rationale and development documents for other source categories of nonharmful quantities of oil; and revised the National Contingency Plan.

1979 Program

The spill prevention and response resource levels are $8,358,300 and 119 positions for 1979. The program expects to respond to 840 inland spills and water related environmental emergencies that will require an on-scence coordinator to direct and monitor clean-up activities. The program will inspect approximately 1,100 facilities for compliance with spill prevention and control plans. The projection of fewer compliance inspections in 1979 is based on the need to divert resources to the newer hazardous substances spill response program required under the amended Clean Water Act and the new Section 311 regulations.

Contract funding of $3.5 million will be used to provide major technical assistance and support to current EPA efforts. The contract will be carried out by 32 contractor personnel to help respond to oil and hazardous materials spills and environmental emergencies, perform inspections for compliance with oil prevention regulations, prepare cases and related actions to support enforcement, assess spill damages, and provide training to Federal, State, and local officials. An additional $1 million in contracts is also provided, of which $500,000 pertains to development of hazardous substances prevention regulations, aerial surveillance support, and emergency mapping for major spills, and $500,000 for field support to emergency environmental response units and economic impact assessment of proposed prevention regulations.

Spill cleanup capabilities will be considerably increased by the establishment of a new Environmental Emergency Response Team (ERT). This is an 8-member nationwide team that supports regional capabilities with technical advice and additional manpower when needed.

Highest priority will be given to response to the most severe oil and hazardous substances spills. These are spills presenting the most serious threat to the public health, drinking water supplies, and the environment. Increased emphasis will be placed on hazardous substances regulated under Section 311. Contingency plans will be revised to incorporate hazardous substances regulation changes as a result of the 1978 Amendments to Section 311. The program is examining ways to increase involvement by the States in Section 311 response and prevention programs. The program expects to promulgate amendments to the harmful quality (of oil) regulations and the oil spill prevention regulations to incorporate changes required by the Clean Water Act of 1977.

1979 Explanation of Changes from Budget Estimate

The net increase of +$855,300 results from several actions. An increase of $323,800 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. As a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, +$531,500 was reprogrammed to this activity from effluent standards and guidelines ($289,300) and from agency support ($242,200) to help establish and support the National Environmental Response Team.

1980 Plan

The spill prevention and response program request for 1980 is $8,118,000 and 122 positions. This represents a decrease of $240,300 and an increase of three positions. The program plans to continue to develop, implement and maintain a national oil and hazardous substances spill prevention, response, removal and mitigation program pursuant to Section 311 of the Clean Water Act of 1977. The program expects to respond to approximately 930 inland spills and water related environmental emergencies and to inspect about 1,500 facilities for compliance with spill prevention regulations and plans.

In 1980, the program expects to provide program management to implement the national spill program at the regional level; provide policy guidance and technical assistance for spill response to regional response teams (RRT) and on-scene coordinators (OSC); continue development and deployment of the ERT; continue development of the technical assistance teams (attached to each region and the ERT) under the contract awarded in 1979; provide liaison with U.S. Coast Guard and other national response team (NRT) members; review and revise the National Contigency Plan and review Regional Contingency Plans; continue to support aerial photo mapping and oil pollution prevention compliance monitoring of facilities; improve aerial and on site monitoring and detection capability for hazardous substances spills; complete interagency agreement with the U.S. Coast Guard for oil spill surveillance; and provide contract support for implementing the hazardous substance response and prevention program.

DREDGE AND FILL REGULATIONS

1978 Accomplishments

The dredge and fill regulations program included 30 positions and $848,000 in 1978. Specific accomplishments included:

- Expanded Section 404 permit reviews beyond traditionally navigable waters and their major tributaries to include the remaining waters of the United States.

- Drafted Section 404(b) guidelines for dredged or fill disposal site selection.

- Completed analysis for and drafting of regulations for State Section 404 permit program operations (40 CFR 126); drafted Section 404(c) veto regulations.

- Drafted Section 208(b)(4) regulations for statewide best management practice programs for the control of dredged and fill material.

- Participated in the development and proposal of the general State 404 delegation regulations (40 CFR 123).

- Continued assessment of various test procedures for revision of the test manual to provide procedures to identify the quality of the proposed discharge.

1979 Program

The planned 1979 program will include 49 positions and $4,015,000. In 1979, the program will:

- Propose revised Section 404(b) guidelines and provide assistance for their implementation.

- Propose regulations for State program (permit) operation (Part 126).

- Develop constraint guidance on Section 404(f) exemptions.

- Develop and implement strategy for delegating State permit programs.

- Implement veto authority for environmentally unacceptable projects.

- Provide analytical and policy support to controversial permit proposals.

- Refine the wetlands boundary definitions.

- Expand information base for the development of test procedures.

- Develop a mechanism of predesignating under Section 404(c) disposal areas and areas where disposal is prohibited.

- Participate in the review and approval of plans for congressionally authorized Federal projects to assure conformance with Section 404(b)(1) guidelines.

- Initiate development of a public information and education program.

- Provide support to the national wetlands research assessment and to similar activities having the objective of assessing and improving research in the areas pertinent to the Section 404 program.

- Participate in the Water Resources Council program to develop integrated program for the management of floodplains and the protection of wetlands.

- Propose Section 404(c) veto regulations.

transfer of program operations; evaluate existing State programs to identify promising programs for Section 404 transfer.

- Participate in the development of the EPA/Corps of Engineers Memorandum of Agreement required by Section 404(q).

- Assist with the finalization of the general State Section 404 transfer regulations (Part 123).

- Assist with the proposal and promulgation of the Section 208(b)(4) regulations.

- Continue to review Section 404 permits.

1979 Explanation of Changes from Budget Estimates

The net increase of +$2,693,400 results from several actions. Congress provided an add-on of $2,300,000 for the dredge and fill program. A net increase of +$63,700 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, +$329,700 was reprogrammed to this activity from agency support.

1980 Plan

The program resource levels will be $1,723,000 and 49 positions. FY 1980 will be a critical transition year for the dredge and fill program since: (a) most regulations will be finalized during this year, and (b) jurisdiction for some of the Nation's waters (Phases II and III) will begin to shift from the Corps of Engineers to qualified States. A major activity will be to guide and support the States in State Section 404 program assumption. Moreover, as the program emphasis swings away from developing and issuing regulations, the program must begin the more complex task of building a comprehensive national program to more effectively and consistently implement the regulatory mandates while developing nonregulatory alternatives and supplements for protecting aquatic resources.

Specific activities for 1980 include:

- Promulgate Section 404 program regulations (Part 126); Section 404(b)(1) environmental guidelines; Section 404(c) veto regulations; and issue ancillary guidance.

- Evaluate the need for and practicability of pre-permit Section 404(c) designations; exercise Section 404(c) authority to prevent specific proposed dredge or fill discharge activities that are found to be environmentally unacceptable; and establish a centralized capability to provide rapid field support for Section 404(c) actions.

- Develop strategies and policies for transfer of programs to States and review of State program applications; provide assistance to a selected number of States in developing their programs for submission to EPA; conduct regional/State workshops on transfer of Section 404 programs to recommend to the Administrator their continued approval or withdrawal; and review and advise on approval of new State program applications for assuming the Section 404 permit program and the Section 208(b)(4) program.

practices (BMP) for placement of dredged or fill material.

- Provide national policy guidance for review and comment on general and individual permit applications and provide recommendations to higher management on controversial permits.

- Coordinate Section 404 activities with other Federal agencies involved in the Section 404 program in related programs.

- Participate in EPA/COE Research Committee, the national wetlands research assessment, or other research assessment/management programs to ensure the continuation of sound program research.

- Assist regions in strengthening regional program capabilities.

- Review and provide comment on the EISs associated with congressionally authorized construction projects for their conformity with the Section 404(b)(1) Guidelines.

- Develop an information and education program to cultivate public awareness of the Section 404 program and the values it is designed to protect.

- Establish a national data base on permits and other program information.

- Assess the need for Section 307(a) standards for dredged material.

Water Quality Monitoring and Analysis

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation					
Water Quality Monitoring and Analysis.....	$8,161	$6,584	$8,835	$8,562	-$273
Permanent Positions					
Water Quality Monitoring and Analysis.....	203	157	157	175	+18
Full-time Equivalency					
Water Quality Monitoring and Analysis.....			239	244	+5

Budget Request

An appropriation of $8,562,000 and 175 positions is requested for 1980. This represents a decrease of $273,000 and an increase of 18 positions. Included in this total is $2,070,000 for contracts and $450,000 for interagency agreements.

Program Description

This program provides: pollutant-by-pollutant control strategies based on assessments of environmental distribution, exposure/risk, and fate for controlling the 65 classes of pollutants stipulated in the toxics Settlement Agreement and the Clean Water Act; area-by-area regulatory strategies and guidance to the States for geographic areas where best available technology (BAT) may not be adequate to control pollution, including identification of toxic pollutant "hot spots"; industrial/environmental assessments for the 21 primary industrial categories to assist in the development and defense of BAT regulations; assessment of monitoring information to help direct the integration of Office of Water and Waste Management programs; assessments of the source of toxic pollutants entering publicly owned treatment works (POTW) and recommendations for appropriate regulatory strategies; and implementation of State basic water monitoring programs to provide increased intensive surveys, biological monitoring, and monitoring of toxic pollutants in response to the Settlement Agreement and the Clean Water Act. Resources also include field sampling and analysis to detect and measure the 129 priority pollutants; and operation of EPA's water quality data systems for management of toxic pollutant and other data, including standardization of storage protocols and quality assurance. It also includes management overhead for the regional Surveillance and Analysis Divisions which are responsible for monitoring in all media including water, air, toxics, enforcement, and pesticides, and for coordinating surveillance and analysis among States and other Federal Agencies.

1978 Accomplishments

In 1978, emphasis was placed on specific toxic pollutant monitoring activities. Included in the overall obligations of $8.2 million were $760,000 for an interagency agreement with the U. S. Geological Survey for provision of sampling and analysis support, and $186,000 in contracts to assist in the management of data. Principal accomplishments include:

- Continuation of environmental assessments of toxic pollutants to meet the requirements of the Clean Water Act and the Settlement Agreement.
- Location and documentation of 21 potential toxic pollutant "hot spots."
- Implementation of the basic water monitoring program for use by States including increased emphasis on toxic pollutant monitoring, biological monitoring, and intensive surveys.

- Operation of a toxic pollutant monitoring program through interagency agreements for chemical and fish tissue analyses, and field monitoring by contractors, EPA, and the States to help determine geographic distributions and exposure/risk of toxic pollutants.

- Evaluation of quality assurance procedures in State water monitoring laboratories to ensure detection of toxic pollutants.

- Analysis and publication of water pollution improvement in six additional areas to describe and document successful programs which may be adapted for use elsewhere.

- Preparation of the water quality inventory report required by Section 305(b).

- Implementation of a biological monitoring pilot project to develop methods to use biological data in regulatory and management decisions.

- Continuation of an interagency agreement with U.S. Geological Survey for its provision of water sampling and laboratory analysis support.

1979 Program

In 1979, $8,835,000 and 157 positions are allocated to water quality monitoring and analysis primarily for determining and implementing control options for toxic and other pollutants. Of these funds, $2,166,800 will be used to determine toxics contributions from publicly owned treatment works (POTW) and for exposure/risk assessments, and $946,000 for biological and chemical monitoring to determine geographic distributions of toxic and other pollutants. Programs include nationwide operation of the State basic water monitoring program emphasizing toxic pollutants and intensive surveys, and increased EPA and contractor collection and analysis of toxic pollutant data and information to meet the requirements of the Clean Water Act and the Settlement Agreement. Projected accomplishments include:

- Assessment of environmental exposure/risk and geographic distribution of certain toxic pollutants to set revised best available technology regulations, pretreatment and new source performance standards, water quality standards, and Section 307(a) toxics standards.

- Investigation of 21 potential toxic "hot spots" to determine actual levels of toxic pollutant contamination and to develop control options.

- Completion of the implementation phase of the basic water monitoring program for State collection of ambient, effluent, toxics, and biological data.

- Continued evaluation of quality assurance procedures in selected State and contractor water laboratories for accurate detection and measurement of toxic and other pollutants in ambient water and effluents.

- Analysis and publication of water pollution improvement in six to eight additional geographic areas to describe and document programs which are successful and may be adaptable to other areas.

- Operation of water quality and toxic pollutant data management systems to provide access and analysis of available information on toxics and other pollutants.

- Continuation of an interagency agreement with the U.S. Geological Survey to collect and analyze water samples for use in assessing problem areas and water quality trends.

- Continuation of an interagency agreement with the Fish and Wildlife Service to analyze fish tissue for the presence of toxic substances. This will help assess probable exposure and risk and determine geographic distribution of toxic pollutants.

- Completion of a pilot biological monitoring pilot project to develop techniques for using biological data as part of toxic pollutant analyses.

1979 Explanation of Changes from Budget Estimate

The net increase of +$2,251,100 results from several actions. A net increase of +$596,800 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. In addition, +$1,654,300 was reprogrammed to this activity from agency support costs.

1980 Plan

In 1980, $8,562,300 and 175 positions are requested, a decrease of $273,000 and an increase of 18 positions. Approximately $670,000 will be utilized for contracts and interagency agreements to determine geographic distributions and to assess exposure/risk of toxic pollutants; $1,400,000 for contracts to assess toxic pollutant contributions to publicly owned treatment works (POTW); and $450,000 for interagency agreements to perform biological and chemical monitoring.

Major accomplishments planned for 1980 include determination of geographic distributions, mass balances, and exposure/risk analyses for selected toxic substances and include implementation of a limited biological monitoring program. The planned outputs are:

- A detailed assessment of the sources of toxic pollutants to publicly owned treatment works (POTW), and analysis of regulatory strategies, including controls under TSCA and RCRA.

- Assess environmental exposure/risk and geographic distributions for additional toxic pollutants for setting revised best available technology regulations, pretreatment and new source performance standards, water quality standards, and Section 307(a) standards.

- Identify and document toxics "hot spots" and provide technical evaluation and definition of control options for toxic pollutants within the framework of overall water quality management planning including controls of specific pollutants, certain categories of industries, and/or in certain geographic areas where advanced waste treatment or wasteload allocations may be necessary to control water pollution.

- Operation of the State basic water monitoring program to include toxic pollutant and biological monitoring and intensive surveys.

- Continue and improve data systems to provide to pollution control agencies, at all levels of government, widespread access to toxic and other pollutant data.

- Evaluate quality assurance procedures in selected State and contractor laboratories to provide accurate detection and measurement of toxic and other pollutants in ambient waters and effluents.

- Implement biological sampling utilizing various biological monitoring methods and techniques for biological data interpretation to screen for presence of toxics and to pin-point needs for chemical monitoring.

- Analyze and publish water pollution improvements to describe and document successful programs which may be adaptable to use elsewhere.

- Continue an interagency agreement with the Fish and Wildlife Service to analyze fish tissue for the presence of toxic substances. This will help determine geographic distributions and exposure/risk of toxic pollutants.

Abatement and Control

Municipal Source Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Municipal Waste Treatment Facility Construction...	$25,383	$27,676	$27,026	$24,486	-$2,540
NEPA Compliance-Municipal Waste Treatment Facility Construction.....	7,987	7,528	7,631	9,500	+1,869
Corps of Engineers-Municipal Waste Treatment Facility Construction.....	4,674	24,000	16,000	22,800	+6,800
Subtotal.....	38,044	59,204	50,657	56,786	+6,129
Waste Treatment Operations and Maintenance.....	1,728	1,768	2,051	1,426	-625
Manpower and Training.....	2,867	5,013	3,554	4,169	+615
Total.....	42,639	65,985	56,262	62,381	+6,119
Permanent Positions					
Municipal Waste Treatment Facility Construction...	856	938	851	771	-80
NEPA Compliance-Municipal Waste Treatment Facility Construction.....	96	80	80	98	+18
Corps of Engineers-Municipal Waste Treatment Facility Construction.....					
Subtotal.....	952	1,018	931	869	-62
Waste Treatment Operations and Maintenance.....	54	62	46	44	-2
Manpower and Training.....	47	25	26	18	-8
Total.....	1,053	1,105	1,003	931	-72
Full-time Equivalency					
Municipal Waste Treatment Facility Construction...	...	...	976	912	-64
NEPA Compliance-Municipal Waste Facility Construction	...	...	97	94	-3
Corps of Engineers.....	...	...	...	...	...
Subtotal.....	...	...	1,073	1,006	-67
Waste Treatment Operations and Maintenance.....	...	...	49	47	-2
Manpower Planning and Training-Water Quality..	...	...	42	30	-12
Total.....	1,053	1,105	1,164	1,083	-81

Budget Request

The 1980 request is for $62,381,000 and 931 positions. Administration of the municipal source control activity in 1980 is expected to require an additional $6,119,000 above the 1979 level. This increase is due mainly to an increase of $6.8 million for the interagency agreement with the Corps of Engineers; a $1.9 million increase in the Environmental Impact Statement (EIS) preparation contract to provide for a greater number of EIS for construction grants projects; and a net decrease in salary costs resulting from the 72 positions partially offset by small increases in other contracts. Depending upon the actual phase-in schedules of Corps subagreements with each EPA region, actual costs for 1979 may exceed the $16 million provided in the current estimate in which case the agency will propose a reprogramming of funds to cover the additional costs.

The 72 position reduction in permanent positions from the 1979 level is principally to take advantage of the expected increase in State manpower resulting from State delegation of selected construction grants activities and the Corps of Engineers increased effort in post-Step 3 management. The State commitment under delegation toward assuming increasing portions of program management allows EPA to shift these positions toward other high priority activities (such as toxic substances, hazardous wastes, and air), while continuing to increase overall management in the construction grants program.

Program Description

The municipal source control subactivity is composed of two program areas. The first, the municipal waste treatment facility construction program, derives its legislative authority from Title II of the Clean Water Act (CWA). For budgetary purposes, the program is divided into three principal subareas: (a) construction grant program management activities, (b) NEPA compliance for construction grants, and (c) the Corps of Engineers agreements for management of the construction phase. Second, the municipal operations and manpower planning and training program derives its principal authority from Title I, Section 104 and 109 through 112, and portions of Title II and Title IV of the Clean Water Act (CWA). The funding provided under this subactivity covers only the direct costs of operating both programs. Omitted are the municipal construction grants funds (including State management assistance grants), which are included in a separate appropriation account (construction grants) and the academic training grant funds provided under the Grants Assistance program subactivity.

The municipal source control activity is undertaken primarily in the EPA regional offices, where all the grant activity, NEPA, and associated administration of the grants program and post-construction activities take place. The direct training and operational technology activities of the municipal operations and training programs are located at the National Training and Operational Technology Center in Cincinnati, Ohio. The remainder of the subactivity - program policy, administrative and management oversight, and needs estimates - resides in headquarters, primarily in the Office of Water and Waste Management.

The first program area -- the administration of the grants program for construction of municipal waste water treatment facilities -- will involve 869 direct personnel in 1980 of which 778 are in the regional offices and 91 are in headquarters, along with substantial contract and interagency assistance. The principal goal underlying the grants program is to eliminate the municipal discharge of untreated or inadequately treated pollutants and thereby help restore or maintain the quality of the Nation's waters and protect the health and well-being of the people. The major operational objectives guiding EPA's program administration are to achieve the most cost-effective, environmentally sound, and timely abatement and municipal waste water pollution control through proper planning, design, and construction of treatment works; to protect the fiscal and technical integrity of the program through sound management and close project oversight; and to encourage maximum State participation in program administration through both technical assistance to improve State program management and delegation of program management responsibilities. Areas of continued attention include more careful review of projects requiring waste treatment more stringent than secondary, improved environmental reviews, more face-to-face contact with grantees, an improved public participation program, encouragement of alternatives

to conventional treatment (including land treatment), closer oversight and review of cost-effectiveness methodology, better State project planning, and other activities prompted by new environmental initiatives and recent legislative amendments. EPA will direct its construction grants funds to those municipal projects required to comply with the enforceable environmental goals of the Act. In addition, EPA will begin implementation of the Administration's directives on water conservation and the urban and rural initiatives, starting in 1979.

The second area -- the municipal operations and training program -- involves 62 positions. The principal objectives for this area include :

Development and maintenance of State and local municipal operations programs -- This involves continuous assessment of public waste water treatment plant operational efficiencies through a plant operation and maintenance inspection program. Inspection results are reported annually to Congress in accordance with Section 210 of the Act. The program supports State, local, and private sector efforts to improve plant operations and maintenance through the development of guidance materials and manuals; identification of planning, design, research, and training needs; conduct of technical assistance demonstration programs; and public awareness activities.

Development of trained water pollution control personnel to implement programs authorized by the Clean Water Act of 1977 -- These include (a) training and certification of municipal waste water treatment facility operators and related personnel to improve plant efficiency in existing plants and assure efficient and reliable operation of new federally funded plants; (b) development of manpower planning capabilities in EPA regions and State agencies to systematically assess the needs for professional and subprofessional pollution control manpower; and (c) training of EPA, State, and private sector agency personnel in the technology of abatement and control of water pollution through short-term training courses, development of audio-visual training aids, and delivery of training resources for the purpose of developing effective state and local water pollution control training programs.

MUNICIPAL WASTE TREATMENT FACILITY CONSTRUCTION

1978 Accomplishments

The level of new construction grants activity dropped sharply from the peak of 1977 in part, as a result of a delay in receiving supplemental funding until March, 1978, but also because of major changes to the Clean Water Act. In combination, these two situations caused a degree of uncertainty in the States and grantees regarding the future management and direction of the program. The full implementation of the Act, particularly in those areas requiring readjustments (such as State delegation), will continue to affect program operations and EPA staff use through 1980.

The following table summarizes the program for 1978.

Item	FY 1978 Number	FY 1978 Amount (dollars in millions)
Total Obligations(Gross).....		$2,860
Total Outlays.....		3,187
Awards Processed:		
Step 1 Awards.....	926	$136
Step 2 Awards.....	589	$111
Step 3 Awards.....	760	$2,613
Active Projects:		
Step 1.....	5,235	$549
Step 2.....	1,701	$418
Step 3.....	3,547	
Section 8(P.L. 84-660).....	904	$16,171

Item	FY 1978 Number	FY 1978 Amount (dollars in millions)
Step 3 (Completions).....	606	
New EIS Initiated.....	45	

The major workload intensive efforts in 1978, other than grants management, were two-fold: (a) the implementation of the new Clean Water Act (P.L. 95-217) amending the Federal Water Pollution Control Act, and (b) the initiation of a new 3-year agreement with the Corps of Engineers, under which the Corps agreed to provide up to 600 workyears to supplement EPA construction grants management activities. The first -- the implementation of the new midcourse correction legislative provisions -- required major new regulatory and policy development, particularly in areas that significantly impacted grants management. The final regulations were published in the Federal Register on September 27, 1978. The second -- the Corps of Engineers interagency agreement phase-in -- required negotiation of detailed subagreements between each EPA regional office and the related Corps personnel. Approximately 300 workyears of Corps effort were in place on September 30, 1978.

Major municipal areas requiring new regulations, primarily as a result of the new amendments, included (a) the new emphasis and incentives for use of innovative and alternative technology; (b) changes in works eligibilities and their impact on facilities planning, (c) changes in secondary treatment requirements for ocean outfalls; (d) restructuring of priority list planning requirements to accommodate set-asides for pipe projects, small communities, innovative technology, and individual systems; (e) user charge changes; (f) State management assistance procedures; and (g) improvements in cost-effectiveness procedures; and (h) improvements in cost-effectiveness guidelines. Immediate regulations were required in several cases to both allot the new funding and implement other sections effective upon enactment. A special manpower intensive effort was required to begin to implement the new State management assistance legislation, which, with the Administrator's approval, may permit the States to use up to two percent of their allotment for State operations under delegation.

The negotiation of the Corps interagency agreement involved both a general national agreement between the Administrator and the Chief of Engineers, and 10 implementing subagreements between EPA regions and Corps division offices. All agreements were completed by May 1978. Generally, the Corps agreement provided for Corps services in three areas: (a) on-site presence during construction for all projects greater than $50 million; (b) performance of construction engineering functions (such as inspections, review of change orders, outlay management, construction close-out, and management oversight) on all projects which have received a Step 3 grant award; and (c) review of plans and specifications to ensure that the plans are both biddable and constructable before the contract awards are let. In all cases, Corps activity would continue only until a State received EPA delegation and was fully able to assume authority for these activities.

Continued efforts to improve management, protect project integrity, and provide technical assistance were a high priority in 1978. Some of the major activities included development of more rigorous controls on funding of waste treatment projects more stringent than secondary, issuance of an environmental assessment manual, development of a sludge management bulletin, better and more frequent preapplication conferences, implementation of "streamlining" recommendations to simplify and expedite grant processing, closer project oversight through interim review of project performance, and more frequent construction inspections. The Agency undertook a detailed review of the existing policies, regulations, and guidelines to meet the new Administration initiatives related to water conservation and rural and urban issues.

1979 Plan

Fiscal Year 1979 will be the first full year of the new legislation, with most provisions supported by final regulations and new policy guidance. Approximately 3,200 new awards are expected to be made, totalling $3.4 billion. Approximately 11,100 projects will be in preconstruction or construction stages by year end, including almost 4,950 facility planning projects, 1,900 design and 4,250 projects under construction. The following table summarizes the program planned for FY 1979:

Item	FY 1979 Number	FY 1979 Amount (dollars in millions)
Obligations	...	$3,400
Total Outlays	...	$3,100
Awards Processed:		
Step 1 Awards	1,000	$100
Step 2 Awards	1,200	$400
Step 3 Awards	1,000	$2,900
Step 3 Completions	1,225	
New EISs Initiated	45	

The program in 1979 continues the transition phase resulting from the many changes that have occurred over the last year, prompted principally by the new Clean Water Act and other Agency initiatives to improve project integrity and expand the resource base for overall management. These new initiatives coexist with current legislative requirements to fully obligate all 1978 funds by September 30, 1979, to avoid reallotment of funds.

A principal task in 1979 is to complete implementation of the new requirements mandated through the Clean Water Act through issuance of implementing guidance, guidelines, and procedures. Among the major changes requiring such guidance are preferences in the Federal share and the cost effective analysis for innovative and alternative projects. These preferences reinforce the Agency push toward land treatment, reuse and recycling, water and energy conservation, and greater public participation in all levels. The new statute recognizes that conventional facility planning has resulted in high operation and maintenance burdens on the consuming public. Thus, changes in the Agency guidance are required to deal with population projections, facility staging, flow calculations, water conservation, cost-effectiveness, and other substantive provisions of policy. Similarly, there are many new policies and requirements, such as minority business enterprise, long-term priority list planning, public participation, marine discharge permit modification review, and Buy American, which require careful implementation through guidance and procedure development. All these changes require special attention, technical assistance to grantees and States, and increased EPA effort to properly and effectively implement.

The Conference Report to the 1979 appropriations bill regarding funding of waste treatment projects more stringent than secondary will be fully implemented during 1979. The Report requires detailed scrutiny at several levels of all projects more stringent than secondary. Congress directed that the Administrator personally review grant awards to all projects with incremental costs above secondary greater than $1 million. In addition, EPA will pursue a more rigorous review of all projects requiring treatment above secondary to ensure that State imposed limitations are properly applied and effective. During 1979, EPA expects to review approximately 600 projects more stringent than secondary, of which roughly one third will be reviewed directly by the Administrator.

The implementation of the Corps agreement and State delegation under Section 205(g) requires a major EPA resource effort in 1979. Both of these initiatives will substantially increase the total resources available to the program once fully implemented. In fact, the Corps agreement will allow EPA to perform post-Step 3 management in 1979 at a resource level never before possible, leading to improved fiscal and technical integrity of our projects. The State delegation effort, however, will temporily divert a portion of the EPA resources in 1979 toward completing the initial stages of the negotiation process. Approximately 26 States are expected to receive State management assistance grants during 1979, an increase of 23 over 1978. Most of the remaining States will have entered into preliminary negotiations during the year, leading to a grant in 1980 or 1981. The initial grants will allow EPA to delegate a substantial portion of the program to the States, according to the timing and overall plan in the grant agreements. Resource benefits from these State agreements will begin to be evident in late 1980 and 1981.

Emphasis will continue in 1979 on the municipal enforcement strategy first formulated in 1978. This strategy is an attempt to integrate program activities of the grants, enforcement, and NPDES permit compliance programs, to better coordinate and reinforce planning and scheduling of municipalities to meet the goals of the Act. The principal effort in 1979 will be to implement a program of action throughout EPA and the States, leading to:

- Integrated municipal permit and grants schedules.
- Compatible information systems.
- Internally consistent operating procedures.
- Coordinated grant and enforcement sanctions for noncomplying municipalities.

The overall result is expected to be more effective and expeditious actions directed at meeting the municipal requirements established in the Act.

The Agency will continue in 1979 to stress the overall importance of effective fiscal and environmental management throughout the grants process. A number of major management initiatives, under the general category of outlay management, will concentrate efforts on the post-Step 3 stage. Areas of major concern include (a) a reduction in the overall preconstruction lag after Step 3 award; (b) improvement in the estimation of outlays for Congress for internal decision-making; (c) more expeditious project close-out and final payments, (d) closer monitoring of cost increases through change orders, and (e) closer monitoring of contract schedules to ensure efficient and timely project construction. All these post-Step 3 efforts will make maximum use of the Corps agreements to manage the projects after construction begins. EPA will have most of the management components of this outlay management initiative in place by the beginning of 1980.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$649,600 results from several actions. First, Congress provided an add-on of +$2,500,000 for ocean outfall activity. Second, a net increase of +$2,377,300 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 77 (1978) pay raise. Third, a Presidential Determination Order transferred personnel and related costs for contract compliance activities from EPA to the Department of Labor; of the $1,401,000 transferred by this action, -$502,000 was applicable to this activity. Fourth, -$651,300 was transferred from this activity within the regional offices to reflect actual operating conditions as of the end of 1978 into regional management activity. Finally, as a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, -$4,373,600 was reprogrammed from this activity to regional management ($3,075,600) and regional support ($1,298,000).

decrease of -$8,000,000 results from several actions. The Congress reduced this activity by -$3,000,000, and -$5,000,000 was transferred to areawide waste treatment management resources as repayment for funds in the same amount borrowed in 1978.

NEPA Compliance-Municipal Waste Treatment Facility Construction -- The net increase of +$102,600 results from several actions. A net increase of +$266,600 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of October 77 (1978) pay raise. In addition, -$164,000 was transferred from this activity within the regional offices to reflect actual operating conditions as of the end of 1978 to air quality management implementation within the air media.

1980 Plan

The 1980 program includes $56,786,000 and 869 positions, an increase of $6,129,000 and decrease of 62 positions over the 1979 level. Approximately $22.8 million of this budget will be used to continue implementation of the interagency agreement with the Corps of Engineers to manage the construction phase of the grant program. In addition, $6.6 million of the $9.5 million NEPA request will be used to continue the EIS preparation contract, an increase of $1.2 million over the 1979 level. The additional funds for the EIS preparation contract will allow EPA to increase the number of EISs initiated to 60, an increase of 15 over the 1979 level. The NEPA positions at 98 will cover all EIS preparation and contract oversight, environmental appraisals and negative declarations, and increased efforts in early environmental review (i.e., "piggybacking") during facility plan preparation. In addition, the Agency EIS manual for construction grants will be revised in accordance with the new Council on Environmental Quality regulations.

In 1980, 3,400 new awards will be made totalling $3.6 billion. This represents a small increase over 1979 awards and a significant increase over the number of awards made in 1978. Total projects in various stages of completion by the end of 1980 will be approximately 10,700. This leveling of active project workload does not account for expected increases resulting from a recycling of some Step 2 and Step 3 projects back to Step 1 to properly implement pretreatment, innovative and alternative technology options, or revised lagoon and pond eligibilities. The following table compares the planned 1980 program with the 1978 and 1979 activities.

	1978 Actual	1979 Estimate Planned	1980 Estimate Requested
		(dollars in millions)	
Total Obligations.....	$2,860	$3,400	$3,600
Total Outlays.....	3,189	3,100	3,600
New Step 1 Awards.....	926	1,000	800
New Step 2 Awards.....	589	1,200	1,300
New Step 3 Awards.....	760	1,000	1,300
Construction Completions.....	606	1,225	1,250
New EISs Initiated.....	46	45	60

The program in 1980 will concentrate its resources on completing the implementation of the many new initiatives begun in 1978 and 1979. The principal objective will be to consolidate these efforts into an overall management system that both effectively meets the program objectives and efficiently uses the expanded set of actors (i.e., States, EPA, and Corps) involved in managing program activities. State delegation will increase dramatically, with up to 39 States receiving initial State management assistance grants and virtually all interested States involved in negotiation or implementation of delegation received from the 1978 Needs Survey will allow development of new funding strategies that optimize resources. The rate of obligation, although only at $3.6 billion in 1980, is expected to return to the long-term level of approximately $4.5 billion by 1981.

Beginning in 1980, all pretreatment planning and advanced waste treatment planning related to facilities will be funded under Section 201 rather than Section 208.

The major continuing effort in 1980 will be to properly negotiate and implement delegation agreements in virtually all States expressing an interest in receiving funds under Section 205(g). The 13 States receiving an initial grant in 1980 will begin implementation of delegation activities through the agreed upon staffing and phase-in strategy. The 26 States receiving a follow on grant will increasingly assume direct authority for additional tasks, thus freeing some EPA resources for other construction grant activities. Proper EPA management of this transition period is expected to be resource intensive, and will not substantially free EPA from direct program activities until 1981 and 1982.

WASTE TREATMENT OPERATION AND MAINTENANCE

1978 Accomplishments

During 1978, the waste treatment operation and maintenance (O&M) program, operating with 54 positions and $1.7 million, achieved the following program outputs:

- Identified and documented publicly-owned treatment works (POTW) performance problems and probable causes by means of a national inspection program and provided an annual O&M survey report to Congress.

- Conducted indepth performance evaluations at problem plants and cooperated with compliance/enforcement personnel to assure resolution of major O&M problems.

- Reviewed O&M documents submitted by grantees during Steps 2 and 3 of the construction grants program.

- Encouraged, assisted, and/or trained States and private parties to provide on-site O&M assistance and training to localities to enable them to achieve design efficiencies and comply with regulatory requirements.

- Developed and disseminated technical literature and manuals describing how to achieve efficient and dependable operation and maintenance of POTW.

- Conducted seminars to orient and train consultants and regional/State/local personnel in the principles of sound operation and maintenance as related both to design and ongoing operation of POTW.

- Initiated development of detailed guidance on O&M requirements during all steps of the construction grants program.

- Investigated and evaluated effectiveness of O&M programs in seven States.

- Integrated municipal operation and maintenance inspections and assistance efforts with municipal compliance/water/program goals and activities.

- Developed materials and co-sponsored State and regional meetings of elected and appointed officials to increase public/local decision maker knowledge and concern about O&M problems and their resolution.

The waste treatment operation and maintenance program resources for 1979 are 46 positions and $2,051,000. Surveys have shown no substantial improvement in the performance efficiency of the Nation's waste water treatment facilities over the last several years. During 1979, the operations and maintenance program will concentrate on mobilizing a coordinated, broad based approach to improved performance. This approach will require that several programs devote special efforts to the problems of municipalities. Avenues to be developed include reassessment of O&M inspection program priorities and methods, development of regional and State communications and joint actions with enforcement, increased emphasis, through more specific guidance, on O&M requirements of the construction grant process (including retrieval of grant funds), more effective use of the existing O&M requirement in permits, and closer planning ties with training and research. The O&M program plans also include establishing improved means for integrating O&M provisions into Section 106 grant procedures and activities that will ensure attention to waste water treatment facilities in Section 208 planning.

In 1979, the operation and maintenance (O&M) program will:

- Complete several guidance packages for EPA regional and State construction grants personnel on responding to/enforcing specified O&M requirements during Steps 1, 2, and 3 of the grants program.

- Develop new program guidance for inspection, technical assistance and O&M/enforcement cooperation; coordinate this guidance with regional offices to ensure its inclusion in the State programs.

- Develop technical manuals on plant operations and conduct national symposia on O&M.

- Develop, refine, test and demonstrate improved process control procedures.

- Develop and implement a program for increasing the public awareness and support for improved O&M.

- Provide technical assistance through on-site demonstrations where such activities can be used to train trainers or State and private sector personnel.

- Prepare special legislative mandated reports to Congress and to selected other groups on plant efficiency, associated problems, and their causes. Conduct comparative analysis of O&M inspection results on new plants and existing plants.

- Continue region/State municipal facility inspection activities to support planning, construction, operations, and National Pollutant Discharge Elimination System objectives through improved data flow on treatment plant operations and problems.

1979 Explanation of Changes from Budget Estimate

The net increase of +$282,000 results from several actions. A net increase of +$125,200 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, +$156,800 was reprogrammed to this activity from agency support.

In 1980, the budget request of 44 positions and $1,426,300 will be used to maintain efforts to integrate operations and maintenance (O&M) provisions into other EPA water quality programs. The program will:

- Identify, review, evaluate, and track, all Step 3 construction projects with approved start-up packages.
- Inspect new plants for operability within start-up period where start-up packages have been approved.
- Initiate implementation of guidance on O&M requirements during all three steps of the construction grants program. Actual implementation intended to be through delegation agreements with State agencies.
- Document design/equipment deficiencies during Step 2 plans and specifications review; assure correction before grant close-out.
- Conduct performance evaluations at request of Office of Water Enforcement on plants with identified compliance problems, assist in development of enforcement action.
- Conduct follow-up inspections on plants previously evaluated to assure resolution of performance problems.
- Comparatively track the performance of new, federally funded POTW and existing facilities.

MANPOWER PLANNING AND TRAINING

1978 Accomplishments

The manpower and training program, with 47 positions and $2.8 million, supported the development of training and certificiation capabilities at the State and local levels. Programs included (1) financial support of operator certification examination criteria development through the Association of Boards of Certification (ABC), an Association of State Boards of Certification for waste water treatment plant operations; (2) financial support for development of waste water treatment plant operator training curriculum to parallel the ABC operator classification levels I-IV, entry level to supervisory level operators; (3) financial support to the National Operator Training Coordinating Committee, consisting of national associations -- American Water Works Association, Water Pollution Control Federation, and the ABC, to foster coordination of training activities among States; and (4) grant support to State operator training programs.

Direct training support programs also helped development of State training capabilities through (1) development and demonstration of course packages; (2) providing trained instructors; (3) providing short courses in specialized techology for EPA and State personnel; and (4) the expansion of the instructional resources center to provide a focal point for collecting, evaluating, and disseminating training resource information.

1979 Program

The manpower and training program resources for 1979 are 26 positions and $3,554,000. Approximately $700,000 additional contract funds have been added over the 1978 level to assist training activities. Training activities will continue to encourage and support the development of water pollution control manpower planning and training capabilities at the State and local levels. With reduced resources, manpower planning and training activities in 1979 will concentrate on:

(i.e., Section 205(g)).

- Support to the National Operator Training Coordinating Committee and State Operator Training Coordination Committees in the implementation of the Association of Boards of Certification "Brown Book" which provides a comprehensive plan for development and coordination of operator training at the State and local level.

- Support interagency agreements with the Department of Labor (DOL), to provide operator training assistance to the water industry in rural and urban areas.

- Support to the Association of Boards of Certification for the continuing development of State certification examinations.

- Development, demonstration, and distribution of course packages and materials in support of State and local training programs.

- Continued development of the Instructional Resource Center in Cincinnati, Ohio.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$1,458,500 results from several actions. A net increase of +$70,900 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, -$802,000 was transferred from this activity within the regional offices to reflect actual operating conditions as of the end of 1978 to air quality management implementation within the air media ($741,000) and to regional management ($61,000). Finally, as a result of the Agency's ZBB review of priorities and changing resource requirements for its 1979 operating plan, -$727,400 was reprogrammed from this activity to regional management activity.

1980 Plan

The manpower planning and training program resources will be 18 positions and $4,169,000. The following activities will be accomplished in 1980:

- Implement direct training program support, nationally, through financial assistance to States on delivery of training courses; publicizing available materials in the Instructional Resource Center; specialized course development and demonstrations.

- Evaluate water pollution control staffing and training efforts, nationally.

- Continued support to the Association of Boards of Certification for the continuing development of State Certification examinations.

- Continue to administer contractual effort to provide on a region-by-region basis: (a) State and local -- POTW -- staffing and training needs and resource assessments; (b) assistance in developing State and local staffing and training plans; (c) assistance in delivery of training courses to EPA, State, local, and private sector personnel; and (d) evaluation of State, local, and private sector staffing and training efforts.

- Assess need for and train State agency Section 205(g) personnel in construction grants curriculum.

- Stimulate and assist development of Section 109(b) training center and operator training coordinating committees.

Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
Appropriation						
Permits Issuance.....	$7,020	$8,266	$7,776	$9,403	+$1,627	WQ-122
Water Quality Enforcement.....	15,502	16,581	19,864	18,844	-1,020	WQ-125
Total.....	22,522	24,847	27,640	28,247	+607	
Permanent Positions						
Permits Issuance.....	252	339	257	237	-20	
Water Quality Enforcement.....	591	492	543	541	-2	
Total.....	843	831	800	778	-22	
Full-time Equivalency						
Permits Issuance.....	...	...	280	273	-7	
Water Quality Enforcement.....	...	...	638	644	+6	
Total.....	...	...	918	917	-1	

Budget Request

An appropriation of $28,246,700 and 778 positions is requested for this subactivity for 1980. This represents a net increase of $607,000 and a decrease of 22 positons from the 1979 level.

The increase of $607,000 is requested to implement the Agency's pretreatment program and other high priority permits and water enforcement activities. The decrease of 22 positions is a result of Agency reprogramming through the ZBB process to other high priority activities.

Program Description

The National Pollutant Discharge Elimination System (NPDES) permit program is part of the comprehensive effort provided by the Clean Water Act (CWA), to reduce or eliminate point source pollution from industrial, municipal, commercial, and agricultural discharges. The Act prohibits discharge of pollutants to all waters of the United States unless a permit is issued by EPA or an EPA approved State program. The permit is the focal point of a tight regulatory system with precise and detailed abatement requirements, streamlined enforcement procedures, and heavy penalties for permit violation.

The permit is the mechanism for imposing on point source dischargers the uniform national effluent limitations and national performance standards for new source facilities which EPA is required to promulgate. These standards, set by the abatement and control function, establish the maximum amounts of various pollutants which can be legally discharged by a facility. If, at a given facility, the established national effluent limits will not reduce enough pollutants to meet the ambient water quality standards set by the State or EPA, the permit will impose more strict effluent limitations as necessary to meet the water quality standards. These more stringent effluent limits are set by the permit program in coordination with pollution load allocation activities covered under the abatement and control function. Permits are issued on condition that their pollutant reductions be accomplished according to given time schedules.

a Section 301(c) variance to relax best available technology standards for nonconventional pollutants because of the economic condition of a particular facility; a Section 301(g) variance to relax best available technology standards for nonconventional pollutants based on environmental assessments; a Section 301(h) variance for municipal discharges to marine waters where environmental assessments allow; and a variance which governs thermal discharges and cooling water intake structures. Variances from effluent standards may also be granted where it is demonstrated that a facility is fundamentally different from those considered in establishing the standard. In addition, the program assists in the review of Section 208 areawide plans and is responsible for preparing permit conditions which comply with requirements of the Section 208 plan. The program also assists in the review of proposed dredge and fill permits under Section 404 of the Act.

The CWA Amendments of 1977 provided for certain deadline extensions which require permit schedules to be adjusted according to specific criteria and assessments. Such deadline extensions may be provided: (1) to municipalities under Section 301(i) where Federal construction grant funding is not available; (2) to industries planning to tie-in to such municipalities (also under Section 301(i)); and to industries qualifying under Section 301(k) based on the application of innovative technology or innovative systems with potential for significantly lower costs.

Another important function of the program is resolution of adjudicatory hearings held on the terms, conditions, and effluent limitations of permits and on variance determinations. This clears the way for a finally effective and enforceable permit.

A primary goal of the permit program is to encourage States to assume responsibility for the NPDES program. At present, 32 States have assumed the NPDES authority. The permit program devotes a considerable amount of resources to overviewing these State NPDES programs to ensure that these State issued permits conform with national permit program policies and procedures.

In addition, in 1979 and 1980 two new areas are emerging which will require the investment of time and resources. First, these years will witness the implementation of the Agency's pretreatment program, which was reinforced by the CWA amendments of 1977. The permit program was closely involved in developing the general pretreatment regulations (40 CFR part 403) effective in August 1978 and will assume a major part of the responsibility for implementing these regulations. Second, permit program activities in 1979 and 1980 will be devoted to developing and implementing the Agency's plan for consolidation of EPA permit programs.

The water quality enforcement program emphasizes enforcement response to emergencies that involve substantial endangerment to public health and safety. The second major goal is to take enforcement actions against violators of the July 1, 1977 FWPCA deadline as part of the major source enforcement effort initiated in 1978. The third goal is to control toxic substances through a toxic enforcement and compliance monitoring program.

The water quality enforcement program also emphasizes compliance monitoring and enforcement of NPDES waste water discharge permits. Other activities include the enforcement actions necessary to achieve compliance with regulations on spills of oil and hazardous substances, ocean dumping and other related requirements of the CWA, the Rivers and Harbors Act (Refuse Act), and the Marine Protection, Research, and Sanctuaries Act. Most water quality enforcement activities are conducted cooperatively with the States; maximum State assumption of these activities is a primary goal.

EPA's NPDES compliance monitoring program includes compliance review and compliance inspections and actions initiated instances of noncompliance. Compliance review is the review of all status and self-monitoring reports submitted by permittees to EPA and to NPDES States. These reports provide information on planning, construction, operation, and effluent characteristics of treatment facilities. Compliance inspection refers to all field related activities conducted to determine the status of compliance with permit requirements, including compliance evaluations (nonsampling) inspections and sampling inspections.

309(a)(1) Notices of Violations to dischargers with NPDES permits issued by approved States; issuance of Section 309(a)(3) Administrative Orders to dischargers with EPA issued permits to dischargers with State issued permits who fail to comply with Notices of Violation; and referrals to U.S. Attorneys for civil or criminal relief to remedy violations of NPDES permits and Aministrative Orders. The law provides for $10,000 civil penalties and $25,000 criminal fines per day of violation.

The non-NPDES enforcement program is responsible for providing legal support to achieve compliance with Section 311, oil spill prevention and enforcement, of the FWPCA, the Refuse Act, and the Marine Protection, Research and Sanctuaries Act.

PERMIT ISSUANCE

1978 Accomplishments

In 1978, permit program activities focused on reissuing all major permits due to expire in that year so that all major dischargers would be under abatement schedules. Priority was placed on reissuing these major expiring permits before work was commenced on either initial first round issuance of minor permits or expiring minor permits. In 1978, EPA reissued 235 major and 1,626 minor permits, 1,401 to industrial dischargers and 460 to municipal sources.

During 1978, there was an increase in the issuance of "second round" permits conditioned to assure control of toxic pollutants. Because best available technology (BAT) toxic guidelines in the 21 industries identified by the Natural Resources Defense Council (NRDC) Consent Decree were not available in 1978, the issuance of second round permits was complicated. The NRDC Consent Decree, entered into in June 1976, to resolve litigation against the Agency regarding its control of toxic pollutants under the Clean Water Act, requires that EPA regulate up to 65 classes of priority pollutants for 21 industrial categories. The Decree requires that permits in these 21 industrial categories be changed to reflect the best available technology (BAT) guidelines when they are promulgated. EPA policy, developed to deal with the absence of these guidelines in 1978, provided that sources in these 21 industrial categories would be reissued best practical technology (BPT) level permits, and that the BAT guidelines would be incorporated into the permits when they are promulgated.

Program efforts in 1978 were also devoted to considering requests for fundamentally different factors (FDF) variances. Through this variance mechanism, an industrial discharger, if it can show that it is fundamentally different for technical reasons from other dischargers within an effluent guideline category, is allowed to depart from the effluent limitations suited for the facility's situation. In addition, the program was responsible for considering Section 316(a) and (b) thermal and cooling water intake structure determinations.

EPA review of State programs in 1978 ensured the issuance of effective and enforceable permits, the uniform application of policy, and the provision of technical and/or policy support where needed. In addition, the permit program in 1978 continued to strive for the goal of maximizing State participation in the State NPDES program by working with States to develop and assume the NPDES program. In 1978, four States assumed the NPDES program.

In 1978, approximately $540,000 was obligated for contract support of permit issuance activities. Of this amount, approximately $440,000 was used for economic studies and adjudicatory hearing support. The balance was used for information system development.

most significant sources of pollution and thereby achieving the greatest measure of environmental protection possible within resource limitations. The 1979 program will continue to concentrate on applying BPT and BAT level controls to major dischargers with expiring permits and ensuring that these permits are finally effective and enforceable. It is estimated that 932 major permits will be reissued. Because of the significant increase (4-fold) of major permits expiring in 1979 over 1978, a greater portion of 1979 resources has been devoted to permit issuance activities and to resolving stumbling blocks to finally effective permits; that is, applying technical and legal resources to the resolution of adjudicatory hearings on permits terms, conditions and effluent limitations and resolving variance requests. In 1979, the permit program will resolve 237 adjudicatory hearings to clear the way for effective and enforceable permits.

Where BAT guidelines are available, permit issuance activities are focused on reissuing expiring permits according to these guidelines. It is anticipated that BAT guidelines for industries covered by the NRDC Consent Decree - primary industries - will not begin to be promulgated until the last half of 1979. Those primary industries with permits expiring before the promulgation of guidelines will be reissued BPT level permits which will be changed to reflect BAT controls upon promulgation of the BAT guidelines. Where guidelines do not exist for secondary industries (those not specified in the NRDC Consent Decree), BAT controls are imposed on a case-by-case basis.

In 1979, resources continue to be devoted to resolving requests for fundamentally different factor variances. In addition, Section 301(c) and 301(g) variances will begin to take on a greater importance towards the end of 1979. To date, almost 3,000 sources have indicated that they might seek to exercise this variance provision which provides a mechanism for relaxing BAT standards due to economic or environmental reasons. As BAT standards are not expected to appear until late 1979 or early 1980, the workload associated with these variances will be more significant in 1980.

Significant permitting resources will be assigned to the preparation of new schedules for municipal and industrial permits to extend deadlines under provisions of the 1977 Amendments to the CWA. Approximately 10,000 municipalities have requested Section 301(i) extensions and 200 municipalities have asked for Section 301(h) marine discharge modifications.

During 1979, there will be implementation of two new permit program initiatives. First, considerable time and resources at the headquarters level will be devoted to developing a plan for the consolidation of the Agency's permit programs. The proposed plan encompasses the consolidation of program regulations, guidance, forms (e.g., permit forms and application forms) and organizational aspects of the Agency's permit programs. An Agency task force charged with exploring the possibilities of permit consolidation has recognized that consolidation may realize benefits for the Agency, the environment, and the regulated community. It is anticipated that the major implementation effort for this consolidation proposal will be undertaken in 1979 and 1980.

A considerable amount of permit program effort in 1979 is being devoted to implementing the general pretreatment regulations (40 CFR 403) promulgated at the end of 1978. These regulations are designed to control toxic pollutants introduced by sources discharging into municipal systems. The number of facilities covered by the pre reatment regulations is comparable to that covered by the NPDES regulations for direct dischargers (approximately 70,000 facilities). Permit program personnel will be responsible for ensuring that municipalities develop pretreatment programs to control the introduction of industrial pollutants by their industrial users and, in areas where the municipality is not required to develop a pretreatment program, permit program personnel will be directly responsible for ensuring that pretreatment guidelines are complied with by industrial users. Initial efforts in 1979 are focused on developing compliance schedules for municipal permittees, requiring them to develop pretreatment programs and working with the municipalities in developing appropriate programs. In addition, before the end of the fiscal year it will be necessary to

along with the need to insure that promulgated guidelines are complied with by industrial users.

Toward the end of 1979, resources will have to be used to reviewing and approving requests by NPDES States for State pretreatment program approval. The pretreatment regulation, implementing a statutory provision, requires that NPDES states submit a plan for a State pretreatment program by March 27, 1979, if no legislative changes need to be made by the State. It is anticipated that the majority of the 32 approved NPDES States will be submitting pretreatment program plans for approval.

In 1979, resources are also devoted to soliciting comments on proposed revisions of the NPDES regulations, holding public hearings to receive comments on the proposed regulations, and developing the revised NPDES regulations in final form.

The permit program continues to overview State-run NPDES programs and to encourage State assumption of the NPDES program in 1979. During this fiscal year, three States are expected to receive program approval.

In 1979, approximately $770,000 is allocated for contracts to support adjudicatory hearings, permit application development, best management practice guidance, and ADP and information needs.

1979 Explanation of Changes from Budget Request

The net decrease of -$489,800 results from several actions. First, Congress applied a $3 million reduction for position lapse rate to the Abatement and Control and Enforcement appropriations; -$326,700 of this amount was applied to this element. Second, the Congress provided an add-on of +$200,000 for dredge and fill permitting activity. Third, an increase of +$665,200 is due to increased pay costs associated with the October 1978 (1979) pay raise and the distribution of the October 1977 (1978) pay raise. Finally, -$1,028,300 was transferred from this element to the regional management activity ($386,500) and to regional water quality enforcement ($641,800) to reflect actual operating conditions at the end of 1978.

1980 Plan

An appropriation of 237 positions and $9,403,000 is requested for the permit issuance program in 1980. This represents a decrease of 20 positions and an increase of $1,627,000 over 1979.

A good portion of the 1980 resources will be devoted to reissuing major industrial permits with BAT toxic controls and reissuing major expiring municipal permits. It is anticipated that 441 major industrial permits will be issued with BAT controls, 313 with toxic controls and 128 with nontoxic controls, and that 207 major municipal permits will be issued. Again in FY 1980, the program will be faced with issuing some BAT level permits according to promulgated guidelines, and others in the absence of such guidelines. Those permits for primary industries issued in the absence of guidelines will be reissued with BPT level conditions, and the provision that BAT level conditions will be imposed upon the promulgation of the appropriate guidelines.

Using technical and legal resources, the resolution of adjudicatory hearings (approximately 60) on conditions of permits will continue to be a priority activity in 1980. Particular attention will focus on resolving the adjudicatory hearings relating to permits with toxic concerns.

As increasing numbers of States assume the authority to administer the NPDES program, the role of EPA in overviewing States takes on increasing importance. In 1980, considerable effort will be devoted to overviewing the adequacy of State NPDES programs. This overview will entail audits of States' permit programs by teams of regional personnel. It is anticipated that two or three additional states will be delegated the NPDES authority in 1980 for a total of 37 delegated State programs.

requiring the initiation of pretreatment programs by municipal permittees and in approving municipal pretreatment programs. It is anticipated that 66 municipal pretreatment programs will be approved during the fiscal year. In addition, where a municipality is not required to develop a pretreatment program, EPA retains responsibility for insuring that industrial users of municipalities comply with appropriate federally promulgated effluent guidelines for pretreatment. Since the bulk of these pretreatment guidelines are expected to be promulgated during 1980, a good portion of permit program activities during this fiscal year will be devoted to notifying industrial users of the appropriate requirements. In addition, the permit program will be involved with ensuring compliance by industrial users with those guidelines which were promulgated at an earlier date and have compliance deadlines in 1980. It is anticipated that 8,500 industrial sources fall within this group.

In addition, the permit program in 1980 will be responsible for approving State pretreatment programs for those States which required legislative changes in order to assume pretreatment responsibility.

Building on efforts commenced in 1979, the permit program in 1980 will devote considerable time and energy to implementing the permit consolidation effort. It is anticipated that most of the regulatory revisions required under this effort will have been commenced by the beginning of 1980. The majority of the 1980 effort will center on developing consolidated policy guidance, finalizing consolidated forms (e.g., application forms, permits fact sheets), and consolidating regional administration of the applicable permit programs.

The resolution of requests for Section 301(c) and (g) economic and environmental variances will take on more prominence in 1980 with the promulgation of BAT guidelines. It it anticipated that approximately 300 Section 301(c) and/or (g) variance requests will be submitted by 1980.

In addition, the program will continue to consider requests for fundamentally different factors variances. In 1980, a workload of 22 variances is expected.

In 1980, approximately $2,750,000 will be allocated for contract support of permit issuance activites. This amount includes $2,000,000 to develop local pretreatment programs; $500,000 to support adjudicatory hearings; and $250,000 for toxic permit development.

WATER QUALITY ENFORCEMENT

1978 Accomplishments

During 1978, the water quality enforcement program initiated a major source enforcement effort and devoted substantial resources to enforcement actions against major industrial permittees not in compliance with the July 1, 1977, deadline for attaining specified effluent limitations and to enforcement actions against publicly owned treatment works (POTW) with permit schedule violations. Through the end of 1978, 183 civil actions against major facilities were referred to the Department of Justice (DOJ) as part of the major source enforcement effort including 62 actions which were initiated prior to 1978.

In States without an approved permit program, EPA eviewed all major industrial and POTW discharger self-monitoring reports. Regional offices conducted 1,627 compliance evaluation inspections and 1,088 compliance sampling inspections to verify permittee self-monitoring information; reviewed violations identified in permittee self-monitoring reports; and identified and categorized permit violations not indicated in the reports.

strative Orders, and referred 170 facilities, including 121 facilities in violation of the July 1, 1977, deadline to the Department of Justice; regions and headquarters prepared case support for those referrals, including case support follow up.

The Agency continued to monitor and bring enforcement actions in accordance with the oil spill and oil spill prevention requirements of Section 311 of the Clean Water Act (CWA) and the Ocean Dumping Act. Regional offices referred 958 oil spill civil cases to the Coast Guard, seven spill criminal cases to the U.S. Attorney, and conducted 559 proceedings for violations of spill prevention countermeasure and control plans (the SPCC program).

The Agency also held adjudicatory hearings, and brought 246 cases to settlement, in a continued effort to reduce the backlog of major and minor industrial and municipal adjudicatory hearing requests.

Except for environmental emergencies, there was little or no compliance monitoring and enforcement of minor permittees, pretreatment enforcement, Section 404 enforcement, enforcement of agriculture, silviculture and storm sewer permits, or enforcement of hazardous material spills.

Of the $1,410,000 available in 1978 for contract support to water quality enforcement activities, $403,000 of the total contract dollars were used for ADP systems to meet information needs, and to produce regulations, evaluate ongoing programs, and conduct feasibility studies. Approximately $1,007,000 in contract funds were used to provide technical and legal case support and to assist in case preparation for adjudicatory hearings.

1979 Program

During 1979, all activities supporting enforcement actions in emergency situations involving substantial threats to public health and safety will receive the highest program priority.

Following those activities, second priority is placed on concluding the first phase of the major source enforcement effort. This will be accomplished by bringing enforcement actions, most of which were initiated in 1978, against major permittees which failed to complete and put in operation required treatment facilities by the July 1, 1977 deadline, to decision by settlement, administrative process, or court trial. In 1979, the first phase of the major source enforcement effort will be concluded by referring the remaining civil actions against major facilities, now estimated to be about 56 more actions to DOJ. EPA will provide legal and technical assistance for expeditious conclusion of these major enforcement referrals.

The third major priority for the year is development and implementation of a formal toxics compliance/monitoring and enforcement program. During 1979, this will primarily involve development and review of a comprehensive guidance manual which will be used to implement regional toxics program enforcement efforts.

For those industrial and municipal facilities in compliance, a fourth major program priority is to assure that these facilities are maintaining compliance with CWA statutory requirements. Regional offices will conduct 2,595 compliance sampling and compliance evaluation inspections, and take enforcement actions where necessary in an effort to insure continued major industrial and municipal compliance with the established effluent limitations.

EPA will also develop a municipal policy and strategy. This effort is designed to integrate permits, enforcement, and construction grants program activities in order to efficiently and effectively manage municipal facilities into compliance with the Clean Water Act. Enforcement will coordinate in the development of a municipal management system and will initiate enforcement actions where Section 301(i)(1) requests have been denied.

1979.

With increased emphasis on approval of State programs, EPA will provide assistance to the 32 States currently operating approved enforcement programs. Three additional States are expected to have approved NPDES programs by the end of the year. Regional offices will also conduct program management audits and quarterly file audits to assure that States with approved programs continue to maintain standards which are in compliance with nationally established requirements. In the case of States which have not yet received program approval, EPA will work with those States to improve technical and legal capabilities and promote State cooperation and participation in enforcement program efforts.

Except for environmental emergencies, no resources are scheduled for monitoring and enforcement of minor permittees, pretreatment enforcement, Section 404 enforcement, enforcement of agriculture, silviculture and storm sewer permits.

Nonnational Pollutant Discharge Elimination System (NPDES) enforcement will continue, primarily of the oil and hazardous materials spill requirements of Section 311 of the Clean Water Act and the Ocean Dumping Act.

In 1979, approximately $4,415,000 is planned for water quality enforcement contract support. Of this amount, $3,000,000 will be used to supplement litigation and case development efforts; $400,000 will support headquarters work in promulgating regulations, evaluating ongoing programs, and simplifying or automating current operating procedures; $310,000 will be used for permit compliance system operation and maintenance; $705,000 will be used to support the following enforcement activities: regional program operations, including NPDES State audits and responses to emergency situations; technical support for adjudicatory hearings; and compliance monitoring and sampling support.

1979 Explanation of Changes from Budget Estimates

The net increase of +$3,282,000 is the result of several actions. First, Congress applied a $3 million reduction for position lapse rate to the Abatement and Control and Enforcement appropriations; -$3,300 was applied to this element. Second, an increase of +$1,405,400 is due to increased pay costs associated with the October 1978 (1979) pay raise and distribution of the October 1977 (1978) pay raise. Third, +$641,800 was transferred to this element within regional offices to reflect actual operating conditions as of the end of 1978. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$1,238,100 was reprogrammed to this element within regional offices and is attributed to regional reductions in the following: solid waste enforcement ($243,800), drinking water enforcement ($121,300), and toxic substances enforcement ($873,000).

1980 Plan

An appropriation of 541 positions and $18,844,000 is requested for the water quality enforcement program in 1980. This represents a decrease of two positions and $1,020,000 from 1979.

Enforcement actions in emergency situations involving substantial threats to public health and safety will have highest program priority in 1980.

The enforcement program's second priority will be to resolve all remaining enforcement actions initiated in 1978 and 1979 against major permittees who failed to meet the July 1, 1977, deadline, by bringing those cases to decision through settlement, administrative process or court trail.

and expeditous conclusion of major enforcement referrals.

The toxics compliance/monitoring and enforcement program developed during 1979 in response to new program emphasis on control of toxics will be implemented during 1980. The program will use bioassay screening techniques and compliance sampling inspections to determine if the permittee is in compliance with existing effluent limitations, identify those permittees who may have potential toxicants in their effluent which were not identified in the permit, and to provide toxicity data for permit issuance. A pretreatment enforcement program will also be developed, with plans to begin implementing a compliance/monitoring and enforcement program for pretreatment standards before the end of the year.

In those States without approved permit programs, EPA will review all major industrial and POTW discharger self-monitoring reports for compliance with permit conditions. An automated system to detect discharge monitoring report violations is under development to provided for the automated processing and initial review of all discharge self-monitoring reports by the end of 1980. Regional offices will conduct 2,346 compliance evaluation and compliance sampling inspections to verify permittee self-monitoring information. Where necessary, appropriate enforcement actions will be initiated, including issuing Notices of Violation, Administrative Orders, and referring cases to the Department of Justice.

During 1980, enforcement activities in conjunction with the municipal policy and strategy effort will include the issuing of administrative orders where extension requests have been denied; prioritizing of possible referrals for judicial action; and processing of municipal referrals, including legal and technical assistance in support of those municipal case referrals. Emphasis will also be placed on establishing a Permit Compliance System (PCS) and Grants Information Control System (GICS) interface. Enforcement will cooperate in developing procedures to integrate data from the two management information systems into one method of information control to insure routine coordination of construction grants, permitting, and enforcement activities.

In support of an anticipated 60 adjudicatory hearing requests during 1980, enforcement will provide legal and technical assistance to the permit program for resolution of those hearings.

Two to three additional States are expected to receive approval for an enforcement program during 1980. Regions will take an active role in State program development and overview.

Non-NPDES enforcement of Section 311 oil spill requirements and the Ocean Dumping Act will be held to 1979 levels. The Agency will also assure that Federal facilities are in compliance with the requirements of the Clean Water Act.

Approximately $4,174,000 is planned for water quality enforcement contract support in FY 1980. Contracts totaling $3,150,000 will provide for litigation training for regional personnel and case development support activities. Approximately $563,000 will be used for regional program operations, including support for responses to emergency situations; compliance monitoring and sampling; technical support for bioassay screening techniques development; computer programming activities; and technical support for adjudicatory hearings. The balance of funds, $461,000 will be used to provide quality assurance samples to all major NPDES permittees.

Construction Grants

Construction Grants

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Appropriation.....	$4,500,000	$4,500,000	$4,200,000	$3,800,000	-$400,000
Obligations.....	2,859,908	5,000,000	3,400,000	3,600,000	+200,000
Appropriation.....	(2,091,529)	(5,000,000)	(3,281,212)	(3,600,000)	(+318,788)
Contract Authority....	(768,379)	(...)	(118,788)	(...)	(-118,788)
Outlays.....	3,186,825	4,660,000	3,100,000	3,600,000	+500,000
Appropriation.....	(322,900)	(1,020,000)	(280,000)	(1,260,000)	(+980,000)
Contract Authority....	(2,863,925)	(3,640,000)	(2,820,000)	(2,340,000)	(-480,000)
Liquidation of Contract Authority.....	5,000,000	1,400,000	1,400,000	1,500,000	+100,000
Authorization Levels....	5,450,000	6,025,000	5,950,000	5,950,000	

Budget Request

An appropriation of $3.8 billion is requested for 1980 to continue the municipal construction grants program established under Title II of the Federal Water Pollution Control Act, as amended (FWPCA). An appropriation of $1.5 billion is also requested for 1980 for the liquidation of contract authority pursuant to authority contained in Section 203 of the FWPCA.

Obligations for 1980 are expected to total $3.6 billion, an increase of $200 million over 1979. Outlays will increase by $500 million in 1980, to a total of $3.6 billion.

EPA is recommending a legislative amendment extending the reallotment period for all funds authorized under the Clean Water Act (enacted December 27, 1977, for the period 1977-1982), from two-years to three-years, starting with 1978 funds. Current legislation requires that all funds allotted to States from 1978 and subsequent appropriations be subject to reallotment one-year after the year for which they are authorized. A temporary slowing of the program may potentially cause as many as 30 States to lose a portion of their current funds to reallotment if the allotment period is not extended. The principal reasons for this slowing trend are threefold: (a) the delay of the 1978 appropriation until March 1978; (b) the enactment of the new Clean Water Act and resulting program uncertainty, regarding its impact; and (c) a reprogramming of resource effort to implement the 1977 amendments and negotiate delegation agreements with the States and the Corps of Engineers. Current plans indicate that the 3-year period being proposed for the 1978-1982 allotments will accommodate the needs of virtually all States, and loss of funds to reallotment will be minimal.

Program Description

This program provides grants to municipal, intermunicipal, State and interstate agencies to assist in financing the planning, design, and construction of municipal waste water treatment facilities. In addition, under the State management assistance grant program (Section 205(g) of the Act), up to two percent of the funds provided to each State may be used to fund State management of functions delegated through specifically negotiated agreements, depending on the extent of delegation. Amounts made available for obligation are allotted to each State on the basis of formulas set forth in the Clean Water Act (CWA), and subsequent amendments. Within these allotments, grants are awarded on a priority basis for individual projects. Generally, each project is eligible for 75 percent Federal assistance, although grants may provide up to 85 percent for projects using innovative or alternative technology in treatment facility design. The recently enacted Clean Water Act of 1977 amended selected portions of the Act, including provisions for a 5-year extension of the funding authorization and a

mandate to delegate major portions of the program to the States, but did not substantially alter the basic objectives or intent of the original 1972 Amendments (P.L. 92-500).

Under the current legislation, a 3-step approach to funding projects is required. The first step is development of the facilities plan, which includes a preliminary description of the project, a cost-effectiveness analysis of alternatives, an environmental assessment, an infiltration/inflow evaluation, and an identification of effluent discharge limitations. The second step is the development of design plans and specifications. The third and final step is to fund the actual construction of the treatment works. Grants are made for each of these steps, with funding of subsequent steps contingent on the successful completion of prior steps and the availability of funds. Under the new legislation, upon completion of an approved facility plan, communities of 25,000 or less are eligible for a combined design and construction grant in those cases where total estimated cost of treatment works does not exceed $2 million (or $3 million in stipulated "high cost" States). Payment against these obligations are made to the grantee as all or portions of each of these steps are completed, usually in the form of progress payments on a monthly basis.

The State management assistance grant program authorizes, at the Administrator's discretion, two percent or $400,000, whichever is greater, of each allotment to cover the cost of delegation of the construction grants program and (to the extent that funds suffice) the National Pollutant Discharge Elimination System (NPDES) permit, dredge and fill, and Section 208 management of programs to the States. The goal of this program is to allow the States, rather than EPA, to assume responsibility for day-to-day management of construction grants activities. The timing and extent of delegation and financial support to each State depends on the State's ability to operate a program that meets the necessary competency requirements and policy direction mandated by the law and EPA objectives. A grant is given to a State when it can show that it is able to assume delegated responsibility for a substantial portion of construction grants program activities.

Long-term Funding Program

The long-range goal of the construction grants program is to eliminate the municipal discharge of untreated or inadequately treated pollutants and thereby help to restore or maintain the quality of the Nation's waters and protect the health and well-being of the people. Current estimates of the remaining Federal cost of meeting the municipal construction needs eligible under the Act have been set at $69 billion, based on tentative results from the 1978 Needs Survey. This need is spread over 31,000 planned or existing facilities, of which 23,000 are for facilities which include treatment and 8,000 are for sewers only. EPA estimates that 50 percent of the sewered population still is not being served by treatment facilities meeting the 1983 effluent requirements (i.e., best practicable waste treatment technology) established in the Clean Water Act.

The program strategy recognizes that there are limited funds available to meet these pollution control needs and that the funds available must go toward assisting municipalities in meeting the most critical needs in the shortest possible time. Accordingly, the major objectives guiding the program over the near term include the following:

- The funds available must go toward meeting the environmental requirements of the Clean Water Act in an efficient, effective, and timely manner, using stringent cost-effectiveness criteria on a project-by-project basis to ensure the most appropriate use of funds.

- A substantial portion of funds are to be oriented toward innovative and alternative technology leading to more environmentally compatible solutions to waste control, including water and energy conservation, reuse, and reclamation.

- Funds specifically available for State delegation under Section 205(g) of the Act are to be used to maximize State assumption of program activities in the shortest possible time, under specific EPA policy direction and environmental objectives.

- Funding must provide sufficient certainty and stability to facilitate effective planning and management in the States, municipalities, and the private sector.

EPA has established a detailed review process related to funding of advanced waste treatment projects to ensure that such funding is strictly limited to those situations where both the higher level of treatment is necessary to meet water quality standards and where the advanced treatment will work to meet these higher standards. In accordance with the Conference Report of the 1979 appropriation for construction grants, the EPA Administrator is now reviewing all waste treatment projects more stringent than secondary and with costs greater than $1 million.

To meet these objectives, the Administration (as part of the 1979 budget cycle) recommended a long-term funding program of approximately $4.5 billion per year. The $3.8 billion for 1980 ($400 million less than the 1979 appropriation) does not represent a withdrawal from the Administration's long-term commitment to the program. Rather this temporary reduction in the funding level is made possible by a temporary slowdown in the program as the new Clean Water Act Amendments are implemented and major management functions are delegated to the States. In the future, with the Amendments implemented and a substantial number of State delegations in place, it is currently anticipated that higher appropriation levels will be requested. The $3.8 billion represents a necessary minimum to ensure that all States, under the fixed allotment formula legislated by Congress, receive sufficient funds to continue operations. The impact of a lesser appropriation is threefold:

- A significant number of States will fully obligate their 1979 and prior appropriation in early 1980 and use most of their share of the $3.8 billion during 1980. An amount appropriated less than $3.8 billion would interrupt the operations of these States, which would unfairly penalize those States progressing fastest toward meeting the goals of the Act.

- Progress toward State delegation requires sufficient funding, given the two percent legislative limit, to allow full State assumption of tasks in an orderly and planned manner. Virtually all the larger States require the entire two percent of their share of the $3.8 billion. A lower appropriation would reduce the amounts available for State management assistance and force many States to slow or avoid delegation entirely, which, in turn, would result in increased project delay and force EPA to shoulder tasks not planned for in estimating resource needs.

- Most importantly, an appropriation of less than $3.8 billion would introduce greater uncertainty into the long-term Federal commitment, creating in 1980 the same severe disruption in State and local planning and management capability as occurred in 1978. Much of the current slowdown in obligations is attributable to such past funding uncertainties. The program only now is recovering from the disruption caused by the 1977 Amendments and delayed funding in 1978, and cannot easily absorb additional program uncertainty in the appropriation process.

1978 Accomplishments

During 1978, awards in the construction grants program totalled approximately $2.9 billion, comprising 926 Step 1, 589 Step 2, and 760 Step 3 awards. This level of activity resulted in approximately 11,387 active projects in various stages of planning, design, and construction at the end of 1978. Payments totalling $3.2 billion were made and 606 Step 3 projects were completed during the year.

Two factors contributed to the relatively low obligation rate of $2.9 billion in 1978. First, enactment of major changes to the Clean Water Act during the fiscal year caused uncertainty in the States and grantees with respect to the future management and direction of the program. Among other things, the amendments: (a) created incentives for the use of innovative and alternative technologies in municipal treatment systems; (b) provided funding for States to assist them in managing the construction grants program; (c) made special considerations for the needs of small communities; and (d) permitted certain municipalities discharging effluent into deep ocean areas to

apply for waivers to secondary treatment requirements. [illegible] was delayed until March 1978, causing many States to slow down or cease new grant activities as existing funds ran out.

Under Section 205(g) State delegation, the following activities were completed:

- Regulations and policy guidance to implement Section 205(g) were issued and technical assistance was provided to States as required to maximize delegation.

- Initial planning and assessment of delegation potential was completed for all States.

- Negotiations were begun with over 50 percent of States, including resource and organization needs studies.

- Through December 31, 1978, a total of seven States (three before the end of 1978) received State management assistance grants for initial delegation of construction grants program management. These States are Alaska, California, Georgia, Illinois, New Hampshire, Texas, and Wisconsin.

1979 Program

A total of $3.4 billion in obligations is projected during 1979. This will fund 3,200 new awards for the planning, design, and construction of treatment facilities. About 11,100 projects will be in various stages of preconstruction or construction activity by the end of the year. EPA also estimates that 26 States will have received State management assistance grants by the end of 1979, totalling approximately $34 million.

1979 Explanation of Changes from Budget Estimate

The current estimate for new obligational authority is $4.2 billion, $300 million less than the budget estimate projected last year. The difference resulted from congressional action on the appropriation request.

1980 Plan

In 1980, obligations totalling $3.6 billion are projected. The new obligations will support approximately 3,400 awards. This represents a small increase over 1979 awards and a significant increase over the number of awards made in 1978. Total projects in various stages of completion by the end of 1980 will be approximately 10,700. EPA expects to award State management assistance grants totalling $56 million to 39 States during the year, an increase of $22 million and 13 States from 1979.

The following table summarizes the 1980 program and compares the activity levels to the previous two-years.

Item	1978 Actual	1979 Estimated	1980 Estimated
		(dollars in billions)	
Total Obligations.....	$2.9	$3.4	$3.6
New Awards:			
New Step 1 Awards.....	926	1,000	800
New Step 2 Awards.....	589	1,200	1,300
New Step 3 Awards.....	760	1,000	1,300
Construction:			
Completions.....	606	1,225	1,250
Total Outlays.....	$3.2	$3.1	$3.6
State Management Assistance Grants:			
Number.....	3	26	39
Amount.....	$.16	$.34	$.56

Drinking Water

PROGRAM HIGHLIGHTS

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
		(dollars in thousands)			
Research and Development:					
Appropriation.	$16,569	$16,875	$18,017	$23,669	+5,652
Permanent Positions. . .	136	106	132	131	-1
Full-time Equivalency. .	...	...	173	171	-2
Abatement and Control:					
Appropriation.	38,840	53,015	52,305	57,815	+5,510
Permanent Positions. . .	250	408	367	367	...
Full-time Equivalency. .	...	...	389	395	+6
Enforcement:					
Appropriation.	202	961	729	835	+106
Permanent Positions. . .	7	43	32	31	-1
Full-time Equivalency. .	...	...	33	34	+1
Total, Drinking Water Program:					
Appropriation.	55,611	70,851	71,051	82,319	+11,268
Permanent Positions. . .	393	557	531	529	-2
Full-time Equivalency .	...	...	595	600	+5
Outlays.	42,046	34,454	58,950	66,450	+7,500
Authorization Levels . .	112,000	*	116,150	*	

* Authorization pending.

OVERVIEW AND STRATEGY

Assuring the safety of drinking water is primarily the responsibility of State and local governments. However, Congress has determined that the Federal Government should share in this responsibility by assisting, reinforcing, and setting standards for State and local efforts.

The Public Health Service Act and the Interstate Quarantine Regulations provided the original statutory authority for the Federal drinking water program now administered by EPA. The Safe Drinking Water Act of 1974, an amendment to the Public Health Service Act, significantly increased the Agency's authorities and responsibilities. The Act requires the development and promulgation of national drinking water standards and establishes two major areas - public water system supervision and underground injection control. Public water systems programs are designed to ensure the safety of drinking water provided by public water systems. Underground injection control programs are designed to protect present and future ground water sources of drinking water from contamination through injection wells.

Standards Development

EPA is required to establish primary and secondary drinking water regulations specifying the maximum permissible contaminant levels necessary to protect the public health and welfare. Interim primary drinking water regulations which cover such contaminants as bacteria and turbidity have been in effect since June 1977. EPA is currently amending these standards to regulate chloroform, other trihalomethanes, and synthetic organic chemicals. In 1980, the program will develop maximum contaminant levels (MCL's), revise existing standards to incorporate new data, develop a regulatory approach to control contaminants which may increase the incidence of cardiovascular diseases, and develop new regulations to control other harmful contaminants.

Public Water System Supervision

Activities of the public water systems program include laboratory certification, conducting sanitary surveys, review of variances and exemptions, enforcement actions, and public notification. Since the public water systems program includes approximately 50,000 community and 200,000 noncommunity water supplies, State participation is essential to the successful implementation of the Act. Forty States currently have primary enforcement responsibility to ensure compliance with the national drinking water regulations. Another 10 States are expected to achieve primacy during 1979. In 1980, the public water systems supervision program will concentrate on assuring maximum compliance with established drinking water standards and implementation of the new organics regulations. Major activities include monitoring, assistance in the early stages of the design of granular activated carbon treatment systems, reviewing applications for variance and exemptions, and analyzing water quality data. In addition, EPA will continue to encourage acceptance of primary enforcement responsibility in the seven remaining States and territories while administering these programs directly.

Control of Underground Injections

The Safe Drinking Water Act requires EPA to establish regulations for State underground injection control (UIC) programs in order to protect underground sources of drinking water from contamination. EPA has designated 22 States for which an underground injection control program is necessary. The other states will be listed by 1980. Should a State fail to assume primacy, EPA must implement the program.

The underground injection control programs will begin implementation in 1980. The regions will assist the 22 designated States to assume primacy and develop plans for implementing the program in nonprimacy States and on Indian lands.

Surface Impoundment Assessment

In 1980, the program expects to complete the assessment of surface impoundments in 49 participating States to determine the scope of the potential ground water contamination problem. Since preliminary evidence indicates that pits, ponds, and lagoons are a large and serious source of ground water contamination, effective management and completion of the assessment will be extremely important to the future development of both the drinking water and solid waste programs.

Sole Source Aquifers

Under Section 1424(e) of the Safe Drinking Water Act, an run aquifer, or portion thereof, may be designated as the sole or principal source of drinking water if it can be determined that contamination would create a significant hazard to public health. Designation of sole source aquifers can be initiated by the EPA or by petition from the States. It is estimated that in 1979 six petitions will be designated. An additional eleven petitions will be received during 1980.

Research and Development

Drinking water research and development activities are directed toward developing economically sound water supply standards based on scientific data and providing improved treatment technology for control of drinking water contaminants. As part of the health effects initiative, and as part of the continuing need for updated information on organics, the 1980 health effects research program will initiate a thorough investigation of the nature, distribution, and concentration of organic compounds in relation to water supply sources. Chronic toxicity and epidemiological studies will be conducted for major organics so that maximum contaminant levels (both new and revised) can be established. As part of the long-range effort to support the goals of the Safe Drinking Water Act (SDWA), treatment and control technology research will develop

new and improved technology for effective and economical control of drinking water contaminants during treatment, storage, and distribution. In addition to emphasizing work on organics, the 1980 program will conduct field evaluations of inorganics control processes for small systems, continue a program in potable water reuse technology, continue its program of developing techniques for safe potable reuse of waste water and conduct special studies including the determination of the extent to which direct and indirect additives to drinking water add harmful contaminants.

Enforcement

During 1980, the highest priority of the drinking water enforcement program will be enforcement response in emergency situations that involve substantial endangerment to public health and safety. Drinking water enforcement will also focus on public water system implementation and underground injection control (UIC). Public water system implementation program activities will include issuance of variances and exemptions, support of enforcement proceedings initiated in 1979, and initiation of new enforcement actions. A UIC program will be developed and implemented during 1980. Drinking water enforcement will begin issuing permits and initiating enforcement actions to bring permittees in compliance with program requirements.

SUMMARY OF INCREASES AND DECREASES	(dollars in thousands)
1979 Drinking Water Program.	$71,051
Abatement and Control.	+5,510
The increase of $5.5 million represents additional grants for the public water systems supervision and UIC programs and additional implementation support for the program. Funds will be used for the initiation of new activities such as the implementation of the organics standards and the incorporation of noncommunity water systems. Increases in the ground water protection program will be used to implement the sole source aquifer activity, and to provide technical assistance for the State program implementation.	
Enforcement.	+106
The increase of $106,000 will be used to aid in meeting enforcement responses in emergency situations as well as continuing efforts toward enforcement of the public water systems and underground injection control programs.	
Research and Development	+5,652
An increase of $5.6 million is being requested. Approximately $5 million will be used for the health effects initiative to conduct an investigation of organic compounds in relation to water supply sources. The remaining $652.7 thousand will be used to: (1) conduct studies for major organics so that maximum contaminant levels can be established; (2) develop new and improved technology for effective and economical control of drinking water contaminants during treatment, storage, and	

control; (3) conduct field evaluations of inorganics control processes for small rural systems; and (4) continue programs in potable water reuse technology.

1980 Drinking Water Program.	82,319

SUMMARY OF BUDGET ESTIMATES

1. Summary of Budget Estimate

An appropriation of $82,319,000 is requested for 1980. This request, by appropriation account, is as follows:

Research and Development.	$23,669,000
Abatement and Control	57,815,000
Enforcement	835,000

This request represents an increase of $11,268,000 over the 1979 program and provides for additional public water systems supervision program grants ($3 million); upgrading of EPA laboratories to meet the highest priority demands for support of regional programs ($1.3 million); to initiate new activities for the public water system supervision program ($1.2 million); increased emphasis on EPA's public health initiative ($4.9 million); and to continue the demonstration of technology for potable reuse of waste water ($1 million).

2. Changes from Original 1979 Budget Estimate

Changes from the budget are as follows:

	(in thousands of dollars)
Original 1979 estimate.	$70,851
Congressional increases/decreases:	
Contractual services and monitoring and technical support	-10
Academic training	+270
Reduction in lapse rate	-421
Effect of October 1978 pay raise partial absorption.	+373
Proposed October 1978 pay raise supplemental.	+347
Distribution of October 1977 pay raise. . .	+1,054
Office of research and development reprogramming	+460
Headquarters and regional offices reprogramming	-1,873
Current 1979 estimate	71,051

ANALYSIS OF INCREASES AND DECREASES TO OBLIGATIONS

	Current Estimate 1979	Estimate 1980
	(in thousands of dollars)	
Prior year obligations.	$55,611	$74,319
Effect of congressional changes . . .	+265	...
Effect of October 1978 pay raise. . .	+800	...
Effect of reprogrammings.	-1,400	...
Program increases	+11,811	+11,000
Change in amount of carryover funds available	+2,232	-3,268
Change in rate of obligation.	+5,000	...
Total estimated obligations	74,319	82,051
(From new obligation authority) . . .	(65,807)	(76,807)
(From prior year funds)	(8,512)	(5,244)

EXPLANATION OF INCREASES AND DECREASES TO OBLIGATIONS

Congressional changes discussed in the previous section are expected to result in an increase of $265,000 to obligations. The effect of the October 1978 pay raise and annualization of the October 1977 pay raise will increase obligations by $800,000. The reprogrammings made by the Office of Research and Development and other headquarters and regional offices are expected to decrease obligations by $1,400,000.

The increase in budget authority over the 1978 level is expected to result in an increase of $11,811,000 to 1979 obligations; the program changes requested in 1980 are expected to increase obligations by $11 million.

The amount of carryover funds to be obligated in 1979 is $9,512,000, an increase of $2,232,000 over the 1978 level; in 1980, it is estimated that $6,244,000 of carryover funds will be obligated, a decrease of $3,268,000 from the 1979 level.

A change in the rate of obligation is expected in 1979, which would create an increase of $5 million over the 1978 level.

Congressional changes to the water quality budget request resulted in a reduction of $6 million to the research and development contracts and technical support activity of which $10,000 is applied to the drinking water media; and add-on of $270,000 was provided for academic training; and $421,000 was reduced from the abatement and control and enforcement appropriations to implement the $3 million reduction in the lapse rate on filling positions.

Pay raise costs result in a total increase of $1,774,000. The agency request included all funds for the October 1977 pay raise in the management and support media, to be distributed by media at a later date. The increase reflected represents the share of this later distribution.

Finally, agencywide reprogrammings resulted in a transfer of $250,000 from the solid waste media; $1,420,000 to agency management activities; $122,000 to water quality activities; and $121,000 to the air media.

PROGRAM LEVELS	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
Number of States with primary enforcement responsibility for public water systems supervision programs.....	40	49	50	54	...
Underground injection control grants.....	...	18	40	57	+17
Variances and exemptions granted by EPA in nonprimacy States.....	1	20	180	180	...
Sole source aquifer petitions received.....	6	17*	8	14	+2
Sole source aquifer designated	4	...	6	6	...
Laboratories certified.....	288	30	126**	126**	...
Enforcement actions.....	...	20	20	20	...

* Includes petitions received and designation made
** Labs in nonprimacy States

Research and Development

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -	Page
			(dollars in thousands)			
Appropriation						
Public Sector Activities.	$15,737	$16,150	$17,027	$22,944	+$ 5,917	DW-8
Monitoring and Technical Support	832	725	990	725	- 265	DW-16
Total	16,569	16,875	18,017	23,669	+ 5,652	
Permanent Positions						
Public Sector Activities.	128	97	116	122	+6	
Monitoring and Technical Support	8	9	16	9	- 7	
Total	136	106	132	131	- 1	
Full-time Equivalency						
Public Sector Activities. .	...	...	154	162	+ 8	
Monitoring and Technical Support	...	...	18	9	- 9	
Total	...	...	173	171	- 2	

Purpose

The research and development effort supports implementation of P.L. 93-523, the Safe Drinking Water Act of 1974. Research and evaluations are conducted relating to: (1) causes, diagnoses, and prevention of diseases and other impairments in man resulting directly or indirectly from contaminants found in drinking water; (2) the treatment and control of those contaminants; and (3) the provision of dependable, economical, and safe supplies of water, including the protection of underground sources of drinking water. Research is also conducted to develop and implement quality assurance procedures and protocols for water supply laboratories to assure that laboratory analytical data are accurate and valid.

Research and Development

Public Sector Activities

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Health Effects	$ 6,924	$ 7,150	$ 7,316	$12,241	+$ 4,925
Treatment and Ground Water Protection.	8,813	9,000	9,711	10,703	+ 992
Total	15,737	16,150	17,027	22,944	+ 5,917
Permanent Positions					
Health Effects	58	44	48	54	+6
Treatment and Ground Water Protection.	70	53	68	68	...
Total	128	97	116	122	+6
Full-time Equivalency					
Health Effects	...	...	63	75	+12
Treatment and Ground Water Protection.	...	...	91	87	-4
Total	...	...	154	162	+8

Budget Request

An appropriation of $22,944,100 and 122 positions is requested for drinking water public sector activities. This is a net increase of $5,917,200 and six positions over the 1979 level. The major portion of this increase, $4,925,600 and six positions, will be a component of the EPA's public health initiative. This part of the initiative addresses organics in drinking water from a variety of new perspectives to identify key contaminants, associated health problems, and the health benefits derived from utilizing innovative treatment methods. The initiative further emphasizes work on relating cancer, heart disease, birth defects and neurological diseases, including multiple sclerosis to contaminants in drinking water. In addition, an increase of $991,600 will be used to continue demonstration of technology for potable reuse of wastewater.

Program Description

By investigating health effects resulting from organic, inorganic, and microbiological contamination of drinking water, the health effects activity provides the scientific base on which the Agency can base its decision on whether or not there is a need to regulate a contaminant, and the scientific criteria for establishing standards. Alternative disinfectants which do not produce trihalomethanes are also studied to determine whether they are as effective as chlorine, and whether they cause adverse health effects. The investigation of waterborne disease outbreaks provides valuable data for their prevention. Also, health considerations related to potable reuse of highly treated wastewater are studied for future Agency decision-making.

The treatment activity includes research, development and field evaluations designed to ultimately provide a dependable and safe supply of drinking water. It develops, evaluates, and improves the control technology necessary for achieving drinking water standards at a reasonable cost. Both the adaptation of large-scale technologies to small water supply systems and the development of new or special technologies are involved. In addition, analytic methods are developed to assess the quality of treatment processes in reducing contaminants in water supplies to acceptable levels.

The ground-water protection research activity provides the scientific data base for regulatory decision-making regarding protection of underground supplies of drinking water from contamination. Principal outputs are the data on which to base criteria for pollutant source control. Basic to this effort are improving ways to measure and track pollutants as they move and change in the underground environment, and improving ways of predicting such movement and transformation. Technical assistance, technology transfer, and educational programs in ground-water pollution are also important elements of the drinking water research program.

HEALTH EFFECTS

1978 Accomplishments

In 1978, the program had $6,924,300 and 58 positions. The program utilized $3,134,600 for grants, $1,175,800 for contracts, and $162,000 for interagency agreements. During 1978 the program:

- Performed *in vivo* teratogenic analyses on organic concentrates from water supplies in six American cities. No teratogenic effects were found.

- Completed screening tests for mutagenicity on the above concentrates. Mutagenic effects generally were higher where the water quality was more suspect of organic contamination but there were some places where this was not the case.

- Performed epidemiological studies which evaluated the relationship of high concentrations of barium in the drinking water to mortality and to blood pressure. There were indications that concentrations of barium above the present standard may be associated with cardiovascular disease.

- Completed an epidemiological study on a population exposed for three months to chlorine dioxide. No acute adverse effects were found in normal individuals which may be an indication chlorine dioxide may be an acceptable alternative disinfectant to chlorine.

- Exchanged information on *Giardia* research at a symposium attended by personnel from State health departments and research scientists. The symposium identified additional research needs and provided health personnel with improved approaches to the control of this common agent of waterborne disease.

- Published report on contaminants associated with the direct and indirect reuse of municipal wastewater. This literature review of health hazards and presentation of environmental measurements provides useful advice to States concerned with reuse.

1979 Program

The sum of $7,315,500 and 48 positions have been allocated to health effects research in FY 1979. Of this $3,270,000 is for grants, $1,318 000 is for contracts, and $293,000 is for interagency agreements.

The drinking water health effects research program focuses on five areas: organic contaminants, inorganic contaminants, microbiological contaminants, alternative disinfectants, and reuse of highly treated wastewater.

Of the five areas identified above, the FY 1979 research program places highest priority on organic contaminants, with the major emphasis on carcinogenic effects. Since results from mutagenic screening tests performed in 1978 raised questions about water supply sources traditionally considered "clean," a series of tests have been designed for 1979 to determine whether some of these mutagenic effects can be eliminated through water treatment. Organic sample concentrates prepared from drinking water from representative American cities are being analyzed chemically, and screened for mutagenic activity to identify potentially carcinogenic groups of compounds. The analytical and concentration techniques being used to support biological testing are being improved so that the health

results may be more directly linked with the appropriate environmental contaminants. Long-term animal exposure studies will also be conducted on compounds having widespread use as solvents and which are known to contaminate groundwater in some highly populated areas of the country.

Research inorganic contaminants emphasizes cardiovascular disease and urinary stone disease. Because epidemiological studies suggest that small concentrations of inorganics in drinking water may be significantly related to these diseases, we are initiating studies on the physiological availability of inorganics in water to ascertain causal relationships. Other work on inorganics, such as molybdenum and urolitheasis, attempts to relate human concentrations to related health effects in drinking water in the United States. To date, no adverse health effects are found.

The search continues for a disinfectant which is as effective as chlorine but which produces less trihalomethane. The direction taken here is to determine the toxicologic properties of organic and inorganic reaction products for alternate disinfectants. Because these reaction products may have different effects on normal and high risk human populations, impaired animals are being studied to assess risks to susceptible humans such as those with anemia or Wilson's disease (liver and eye lens degeneration due to abnormal copper metabolism). One animal study is comparing the toxicity of the reaction products by utilizing a single water source treated with various alternative disinfectants. Other studies address nervous system, immune response, and tumorogenic effects of specific disinfectant reaction products. A joint study is being conducted with NCI on trihalomethanes at low doses to more closely approximate environmental exposures.

For microbiological contaminants, the health effects research program concentrates on the investigation of outbreaks of waterborne disease. The program assists the Center for Disease Control to identify water supply deficiencies that allowed the outbreaks to occur. Research is also continuing to focus on the parasite Giardia. Outbreaks of giardiasis have occurred in areas without gross pollution, where waterborne disease historically is not a problem. The occurrence of this parasite and its route of transmission to man are being studied so that control methods may be devised which will interrupt the disease cycle. The role of viruses in waterborne disease is even more difficult to elucidate. Improved detection methods are being developed for viral agents, which are known to be associated with waterborne disease outbreaks, so that the health significance of viruses in drinking water can be more accurately assessed.

An expanded program to study the feasibility of developing criteria for the potable reuse of wastewater will begin in FY 1979. Toxicity screening tests of organic concentrates from different advanced wastewater treatment plant effluents are being conducted and inorganics constitutents identified. More elaborate toxicity testing will be conducted on contaminants for which little health information is available.

1979 Explanation of Changes from Budget Estimate

The net increase of +$165,500 results from several actions. A net increase of +$170,300 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. In addition, the transfer of +$91,000 into this element from drinking water abatement and control was offset by a reprogramming of -$95,800 to agency management.

1980 Plan

In FY 1980 $12,241,100 and 54 positions are requested of which $6,346,200 are planned for contracts, $2,557,400 for grants and $568,400 for interagency agreements.

The $4,925,600 and six position increase over the current level will be used to expand research on organic contaminants of water and to address additional chronic disease problems. This expanded research is part of a major new public health initiative intended to provide the data base needed to reduce the impact of major chronic diseases and disabilities through prevention. The initiative will clarify the role of drinking water contaminants in some cancers, cardiovascular diseases, neurologic diseases and teratogenic defects.

Health effects research in drinking water will focus on organic contaminants as the highest priority in 1980, as it did in 1979. Because results from surveys show organic contaminants occur in treated drinking water, the literature on the toxicity of the most prevalent materials will be reexamined and, where necessary data are lacking, selected toxicologic studies will be conducted. To obtain human health data, specific well-planned epidemiological studies, starting where cancer occurrence in communities is above expected rates, will be completed in 1980. The drinking water quality will be defined by both a chemical analysis and screening tests. Health risk assessment of these epidemiological, chemical, and toxicologic data can provide guideline limits for several chemicals.

The nearly 700 compounds identified so far represent only a small fraction of the organic chemicals in drinking water. Consequently, further efforts will be made to develop bioassay procedures that are indicative of specific health effects risks and may be used for drinking water monitoring. Test systems that currently exist (e.g., Ames test) may not be sensitive enough for use with unconcentrated waters and may show questionable quantitative and qualitative relationships to human health risk. Nevertheless, serious consideration must be given to new or modified methods to characterize the hazards associated with drinking water supplies. If such methods can be developed, standardized, and practically applied, they may be substituted for detailed chemical analyses that would arise from establishing maximum contaminant levels (MCL's) on individual compounds.

Research on organic contaminants of drinking water has focused on carcinogenic effects with some consideration to mutagenic and teratogenic effects. Much work will continue to be devoted to suitably preparing organic concentrates and identifying biologically active fractions. Key compounds will receive long-term toxicologic study. The new initiative, however, will address the organics problem from a variety of fresh perspectives, such as:

- Populations using drinking water with primary contamination limited to a few identified synthetic organic compounds will be studied to identify whether there is a measurable increased risk of disease. This research will provide data on the human health effects of long-term exposure to environmental contaminants.

- Established, short-term *in vivo* assays will be adapted for detecting carcinogenic and mutagenic hazards in drinking water and used on water from 15 American cities and from pilot-plant studies of alternate treatment techniques. If the tests can be successfully adapted to this use they will still be rapid and will have advantages over *in vitro* tests.

- Comparable populations whose drinking water is similar in terms of trihalomethane concentrations but different in terms of non trihalomethane organics will be studied. Initial background studies will be conducted in 1980, preparatory to case control studies of cancer in 1982. These studies will permit estimation of risks associated with non trihalomethane organics.

The health effects research program on organics will direct attention to nitrates in drinking water in 1980. Nitrates are found in groundwater and are associated with methemoglobinemia in infants. The study will attempt to quantify the risk of developing methemoglobinemia from nitrate concentrations in drinking water and to identify other factors which might be important to the development of the disease.

Epidemiology studies will be continued to establish the relationship of cardiovascular disease, especially hypertension, to drinking water quality. The relationship of sodium and 35 other parameters to cardiovascular disease will be examined. Toxicologic studies will be conducted to determine the impact of various combinations of calcium, magnesium, lead, cadmium, and sodium in water on the development of cardiovascular disease. These are long-term studies that will be completed in the next few years.

To date almost all epidemiological studies of the relationships of drinking water quality and cardiovascular disease have been rather broad in nature; that is, the water and health data have been available only for geographical areas rather than for specific individuals. Because of this ecological approach, information on other important risk factors for cardiovascular disease such as smoking, family history, exercise, and diet are not available and thus cannot be considered in conjunction with the water factors. The new initiative will make it possible to begin in 1980 a prospective study of cardiovascular disease in a cohort of middle-aged men. At the beginning of the study and at several other points, the tap water of these participants would be characterized in terms of some eighty elements in the water. Likewise, physical exam, interview, and laboratory tests would characterize other risk factors for cardiovascular disease. The study would be focused on a limited geographical area within which there is a wide range in the hardness of water. The purpose would be to ascertain which element(s) or combination of elements may be the specific components of water hardness which are protective, or of water softness which are detrimental, in the development of cardiovascular disease. Such a cohort (prospective) study would allow not only an identification of the critical element(s) but also a more precise quantification of the degree of risk they incur in the presence of the other known non water risk factors. On the assumption that the water factor(s) are causally implicated, the National Research Council estimated that optional conditioning of drinking water could reduce the annual cardiovascular disease mortality rate by as much as 15% in the United States, thereby saving an estimated 150,000 lives per year.

Cardiovascular disease, unfortunately, is not the only adverse health effect associated with inorganic contaminants of drinking water. Toxicologic studies will be continued on lead to determine whether central nervous system development is delayed by blood lead levels presently considered in the normal human range. The bioavailability of certain metals, including lead, in hard and soft waters and in food will be compared to determine safe levels.

Animal feeding studies to determine whether asbestos is a carcinogen when ingested, were jointly designed with the Department of Health, Education, and Welfare and started in 1977. This work requires another one to two years to complete, so some small, short-term animal experiments will be sponsored to develop some insight as to the consequence of fiber length and mechanism of asbestos as a possible co-carcinogen. Tritium-tagged fibers will also be used to understand the extent of adsorption and distribution in rats. Several epidemiological studies will be continued to determine whether asbestos from natural erosion, mining operations, and asbestos-cement pipe is a contributing factor in increased cancer rates.

The public health initiative will also permit us to investigate the relationship of organic and inorganic contaminants of drinking water to the occurrence of birth defects. Birth certificates indicate over 800 of every 100,000 babies have birth defects, and 80-90% of all spontaneous abortions can be attributed to teratogenic abnormalities. Congenitial abnormalities are a leading cause of childhood mortality and lifelong disability. Although EPA laboratory studies of drinking water concentrates found no teratogenic effects, an epidemiological study conducted by the University of Missouri found a significant association between drinking water quality and birth defects. The public health initiative will undertake further epidemiological studies to determine what constituents of drinking water, if any, are associated with birth defects and whether the relationship is causal.

Neurologic diseases, including multiple sclerosis, will be studied in 1980 to determine whether there is an association between neurologic diseases and certain inorganic, organic, or microbiological contaminants of drinking water. Metallic toxins and viruses are considered by some researchers to be possible predisposing factors for some of these chronic diseases. Since cases of multiple sclerosis occur in a north-south gradient similar to that of certain drinking water parameters, it is hoped that epidemiological research, to be started in 1980, will add to our understanding of these diseases and their prevention.

The search for a disinfectant which is as effective as chlorine but which produces less trihalomethane will be substantially completed in 1980. Reaction products of chlorination and proposed alternative disinfectants will be bioassayed both *in vitro* and *in vivo*. Long-term studies will be completed on the effects of disinfectants and supplemented with epidemiological studies. Such research should provide data useful in assessing alternative disinfection practices.

Waterborne outbreaks of infectious diseases will be investigated in cooperation with the Center for Disease Control with the objective of identifying the etiological agents in water, determining the route of entry and recommending corrective action to prevent recurrence. A two-year project will be completed which evaluates (in various locations) methods of identifying water systems that contain *Giardia* cysts in the raw or treated waters. Raw and treated waters from several sites will also be investigated for the occurrence of pathogens, such as *Yersinia*. Work will continue on improving methods for the identification in drinking water of viruses known to be associated with waterborne disease outbreaks. These improvements will permit a more accurate assessment of the significance to health of viruses in drinking water.

The potential health effects associated with reuse of highly treated municipal wastewater will be studied in 1980. This is part of a program which has as its ultimate objective the development of the data base from which to set criteria for such use. Bioassay techniques developed in conventional drinking water research are applied to the reuse situation. Inorganic and organic constituents of advanced wastewater treatment plant effluents will be identified and additional toxicity studies performed where little health information is available.

TREATMENT AND GROUND WATER PROTECTION

1978 Accomplishments

In 1978, approximately $5,603,900 was devoted to grants; $1,302,800 to contracts; and $224,300 to interagency areements.

In the treatment area, results in 1978 included the following:

- Two documents in support of the proposed regulation on trace organics in drinking water were published. One, the "Interim Treatment Guide for Controlling Organic Contaminants in Drinking Water Using Granular Activated Carbon," provides background technical information on the efficiency of several water treatment processes for organic removal (reduction), and the other document, "Operational Aspects of Granular Activated Carbon Adsorption Treatment," addresses specific questions often asked by the water supply industry.

- A major report on the current international technology of ozonation and chlorine dioxide usage in drinking water treatment was prepared. In this report, special attention was given to collection of on-site data for engineering design of treatment systems and preparation of a comprehensive treatise on the organic oxidation products resulting from chlorine dioxide and ozone application.

- A methodology to examine the organic profiles of extracts from water samples was developed. The methodology is currently being used to evaluate granular activated carbon (GAC) effectiveness for removal of organics from both pilot-plant and full-scale treatment plant operations.

- A German analytic methodology for determining total organic chlorine was evaluated. This methodology will be valuable in developing regulatory strategy for controlling organics in drinking water.

- A field study of small water systems was completed. It provides realistic information on the cost burdens of complying with drinking water regulations.

- A field study of the cost-effectiveness of package water treatment plants was completed. It showed that initial construction costs for these package plants may be as little as half that of conventional treatment plants.

The results in ground-water protection area in 1978 included the following:

- An evaluation of the significant ground-water models in seventeen countries in terms of their usefulness for water resources managers was completed.

- Assistance to the Office of Drinking Water in the development of the Underground Injection Control Regulations was provided, along with the development of supporting technical guidance documents.

- Assistance was provided to the Office of Drinking Water in the planning, preparation, and training required for a national assessment of the ground-water pollution potential of waste impoundments (Surface Impoundment Assessment).

- A ground-water information center was established, as was a clearinghouse for ground-water models, including workshops to bring modelers and water managers closer together.

- A methodology was developed to predict alterations in ground-water quality resulting from coal strip mining.

1979 Program

The sum of $9,711,400 and 68 positions is allocated to this subactivity in 1979, of which $6,070,400 is for grants; $679,600 is for contracts; and $190,000 is for interagency agreements.

In the treatment activity, organic compounds, inorganic compounds (including asbestos), and microorganisms are being investigated. Organics remain the highest priority research area and the greatest emphasis will be given to determining and controlling that problem.

Pilot-plant and field-scale studies are underway to extend the Agency's information on control of the four trihalomethanes that are potentially toxic and have been shown to occur widely where chlorination is practiced. Unit processes such as granular activated carbon beds, powdered activated carbon, and macroreticular resins are also being evaluated to determine their capabilities to remove specific organic contaminants of concern. At the request of the Office of Drinking Water and the American Water Works Association, granular activated carbon evaluations at full scale are being expanded. Several projects evaluating these processes in the field will produce reports in 1979. The opportunity for cost savings via regionalization will be explored.

There is great concern about the capabilities of small systems to meet the requirements of the primary drinking water standards in an economic and reliable way. Projects are underway to evaluate and adapt treatment technology for inorganic contaminant control to make the technology useful to small systems. Contaminants of special concern in small systems are fluorides, nitrates, and arsenic. Processes found effective in bench-level research are being evaluated on pilot- and field-scales.

Microbiological contaminants continue to be of concern, particularly in relation to disinfectants other than chlorine. Evaluations of these alternative disinfectants for their effectiveness in controlling microorganisms are underway to assure protection of the public health.

In the ground-water protection area, efforts will be concentrated on determining the movement and changes in organic pollutants and viruses in the underground environment. These are the least understood potential contaminants of underground sources of drinking water. The effort complements the considerable ground-water research supported by other Federal agencies. A major study on the Garber-Wellington aquifer will be conducted, as directed by Congress. Assistance is being provided to the Office of Drinking Water in conducting the Surface Impoundment Assessment. In addition, an anticipatory research center in ground-water pollution is being established under the anticipatory research program in FY 1979.

1979 Explanation of Changes from Budget Estimate

The net increase of +$711,400 results from several actions. A net increase of +$497,000 results from increased pay cost from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. In addition, the transfer of +$325,100 from drinking water abatement and control was offset by a reprogramming of -$110,700 to agency management.

1980 Plan

A total of $10,703,000 and 68 positions is requested for FY 1980, an increase of $991,600. In 1980 the allocation should be $6,764,300 to grants, $759,900 for contracts, and $214,100 for interagency agreements. In FY 79 Congress appropriated $8 million for a potable wastewater reuse program. The $8 million increase for FY 79 is shown in the Public Sector Activities of Water Quality. $1 million of the $8 million was allocated to funding competitive applications for demonstrations of the technology for potable reuse of wastewater in FY 1979, and at a similar level in FY 80 with the increase provided.

The concept of renovating municipal wastewater for beneficial reuse has been pursued for a number of years. Treatment technology capability exists for most wastewater reuse applications such as agricultural, recreational, and industrial where quality requirements have been, at least, roughly defined. However, due to the present lack of data on the possible effects of potable reuse on human health and treatment systems performance, the necessary quality requirements and the acceptability of treatment proposed for potable reuse is less well defined.

This lack of confidence in the treatment technology has hampered potential reuse situations in areas of the arid southwestern U.S. where the need for additional water supplies is greatest, and it has adversely affected areas in the midwest and eastern parts of the country which are also experiencing occasional water shortages. In those areas where source substitution may not provide sufficient water resources to meet the domestic water supply needs of growing population, the feasibility of potable reuse must be determined.

Recognizing the potential benefits of the planned reuse of wastewater for domestic purposes, and also recognizing the questions associated with the already existing unplanned reuse of wastewaters such as occurs in communities throughout the U.S. which have water intakes downstream of waste discharges EPA has initiated a program to demonstrate wastewater treatment technology for potable reuse. The purpose of this program is to demonstrate wastewater treatment technology (performance, cost, reliability and feasibility) which may ultimately lead to the preparation of safe and acceptable drinking water from wastewater.

In the drinking water treatment area, work will be done on the development and evaluation of technology for the control of organics with emphasis on full-scale treatment processes and the control of inorganic, particulate, and microbiological contaminants. This effort includes the development of cost information for drinking water treatment processes. Distribution system effects on inorganic and microbiological quality of water will also be studied.

In the ground water protection research area, efforts will concentrate on developing a data base for regulatory decisions to protect underground sources of drinking water. Central to this is research devoted to understanding organics and virus movement in the underground environment.

Research and Development

Monitoring and Technical Support

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	1980 vs. 1979 Increase + Decrease -
			(dollars in thousands)		
Appropriation					
Quality Assurance.	$832	$725	$990	$725	-$265
Permanent Positions					
Quality Assurance.	8	9	16	9	-7
Full-time Equivalency					
Quality Assurance.	...	...	18	9	-9

Budget Request

In 1980, an appropriation of $725,000 and nine positions is requested. This budget request is a decrease of $264,900 and seven positions from the 1979 level which will reduce the emphasis applied to the development of an automated laboratory test system.

Program Description

The Drinking Water Quality Assurance program supports the Agency's drinking water program by standardizing the monitoring methods; providing quality control procedures for operational use; supplying standard samples and reference materials; conducting methods validation and performance evaluation studies; developing sampling and analytical methodology and quality control guidelines and manuals; and participating in regional quality control workshops. The Agency uses the procedures, protocols and materials generated by this activity to assure that the data generated from the use of measurement systems is accurate, intercomparable and legally defensible.

1978 Accomplishments

The 1978 resources for this program were $832,000 and eight positions, of which approximately $400,000 were used for contracts.

Accomplishments for 1978 include the following:

- Publication of a manual for interim certification of laboratories involved in analyzing public drinking water. The manual includes chemical, microbiological and radiochemical analyses for Regional and State certification.

- Provisions of quality control samples to analytical laboratories for the analysis of currently regulated contaminants in drinking water.

- Completion of two preliminary interlaboratory performance evaluations as a part of the planned audit protocol for drinking water laboratory monitoring procedures.

- Certification of on-site evaluation teams in all 10 EPA Regions to conduct performance evaluations of drinking water laboratories in their respective Regions.

- Completion of on-site evaluation of 28 radiochemistry laboratories.

- Evaluation and approval of two alternative analytical test procedures for national use.

1979 Program

The 1979 resources for Quality Assurance are $989,900 and 16 positions, of which approximately $453,000 is allocated to contracts. Major activities of the program include:

- National interlaboratory performance evaluations;
- On-site evaluation of principal State radiochemistry laboratories and four EPA Regional radiochemistry laboratories;
- Development, preparation and distribution of quality control and performance evaluation samples for use by EPA Regions and States;
- Validation of several measurement methods for monitoring trace metals and pesticides.
- Preparation and distribution of quality assurance guidance for EPA Regions, including assistance in proper use of test procedures and quality control techniques; and
- Continuation of evaluation and approval of alternate analytical test procedures for national use.

1979 Explanation of Changes from Budget Estimates

The net increase of +$264,900 results from several actions. Congress applied a $6 million reduction to Research and Development activities for contractual services and monitoring and technical support activities; the decrease applicable to this activity was -$10,000. A net increase of +$24,900 results from increased pay costs from the October 1978 (FY 1979) pay raise as well as distribution of the October 1977 (FY 1978) pay raise. Finally, as a result of an intensive ZBB review of priorities and changing resource requirements for the FY 1979 operating plan +$250,000 was reprogrammed to this activity from control technology within the solid waste medium.

1980 Plan

In 1980, $725,000 and nine positions are requested for this program, of which $148,000 will be for contracts. This represents a decrease of $264,900 and seven positions from the 1979 level which will reduce the emphasis applied to this development of an automated laboratory test system.

Major activities of the program include:

- Evaluation and validation of alternate analytical measurement methods, and development and delivery and quality control of samples, reference materials, and technical assistance documents required to support drinking water standards. Using statistical designs and analyses of test results, reference or alternate methods for analyzing drinking water are to be evaluated. A repository of quality control reference samples for radiochemical, chemical, and biological measurements will also be developed;
- Preparation and publication of quality control guidelines, sampling procedures, and analytical methods manuals for radiochemical, chemical, biological, and microbiological measurement methods.
- Development of National guidance to assure uniformity for evaluating and certifying public water supply laboratories.
- Development of an automated water laboratory test system for EPA and State drinking water laboratories.
- Conduct of on-site inspections and performance evaluations of program office, and Regional laboratories to determine the capabilities of measurement systems and operators to analyze drinking water for unknown contaminants.

Abatement and Control

DRINKING WATER

Abatement and Control

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979	Page
		(dollars in thousands)				
Appropriation						
Criteria, Standards, and Guidelines.....	$11,689	$8,693	$9,269	$9,220	-$49	DW-19
State Program Resource Assistance.....	20,484	36,000	36,270	38,795	+2,525	DW-19
Drinking Water Management	6,667	8,322	6,766	9,800	+3,034	DW-19
Total.....	38,840	53,015	52,305	57,815	+5,510	
Permanent Positions						
Criteria, Standards, and Guidelines.....	99	105	103	103	...	
State Program Resource Assistance.....	...	...	...	...	...	
Drinking Water Management	151	303	264	264	...	
Total.....	250	408	367	367	...	
Full-time Equivalency						
Criteria, Standards, and Guidelines.....	...	...	114	119	+5	
State Program Resource Assistance.....	...	...	2	...	-2	
Drinking Water Management	...	...	273	276	+3	
Total.....	...	...	389	395	+6	

Purpose

The Abatement and Control appropriation encompasses activities relating to the development of regulations and establishment of standards necessary to protect the public health and welfare, the development of control strategies and programs, and the implementation of such programs as mandated by the Safe Drinking Water Act, as amended. These activities include the promulgation of primary and secondary drinking water regulations which include maximum contaminant levels, the establishment of minimum requirements for State public water systems supervision and underground injection control programs, and the Federal implementation of these programs if necessary.

The paramount priority of this program is the protection of the public from harmful contaminants found in drinking water. The abatement and control program launches a threefold approach at resolving this problem. Through the development of drinking water standards and regulations, the health quality of drinking water can be achieved and maintained. The Federal Government, realizing the increased administrative costs involved, has provided financial assistance for States which bear primary enforcement responsibilities. Also, technical assistance is provided to help the States implement their programs.

The abatement and control activities are classified under the following subactivities:

Criteria, Standards, and Guidelines - This subactivity is related to the development of drinking water standards and regulations and to the development of State program guidelines and regulations. This activity includes development of information from fundamental studies on health effects, control technology, and monitoring to determine the concentration of hazardous substances in the environment. These include microbiological contaminants (bacteria and virus) and toxic chemicals from natural and synthetic sources. Economic analyses associated with these activities are also included. Under this subactivity, the primary and secondary drinking water regulations are established and the minimum requirements for State programs for the public water systems supervision and underground injection control programs are established. In addition, guidance to the regions for program implementation is provided and congressionally mandated studies are conducted.

State Program Resource Assistance - This subactivity involves the provision of financial assistance to support State activities in implementing the public water systems supervision and underground injection control programs. Training support is also provided.

Drinking Water Management - This subactivity is related to the implementation of regulatory requirements for which the Federal Government is responsible. This includes program oversight in States with primacy, as well as program implementation in States without primary enforcement responsibility, on Indian reservations, and for the interstate carrier programs. Other activities include technical assistance to States in the implementation of public water systems supervision programs and in the establishment of underground injection control programs; technical evaluations of petitions for designation of sole source aquifers; coordination with water quality management planning programs to ensure proper consideration of water supply activities; and technical and policy guidance relating to underground injection.

DRINKING WATER

Abatement and Control

Criteria, Standards, and Guidelines

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Drinking Water Standards and Regulations Development...	$4,024	$4,969	$5,279	$5,220	-$59
State Program Guidelines and Regulations Development...	7,665	3,724	3,990	4,000	+10
Total.....	11,689	8,693	9,269	9,220	-49
Permanent Positions					
Drinking Water Standards and Regulations Development...	35	70	45	45	...
State Program Guidelines and Regulations Development...	64	35	58	58	...
Total.....	99	105	103	103	...
Full-time Equivalency					
Drinking Water Standards and Regulations Development...	...	...	53	53	...
State Program Guidelines and Regulations Development...	...	...	61	66	+5
Total.....	...	...	114	119	+5

Budget Request

An appropriation of $9,220,000 and 103 positions is requested for 1980. The resources will be used to develop additional contaminants standards; provide guidance and assistance to the regions and States for organics removal, treatment technology, emergency response, and implementation of the underground injection control (UIC) program; and review variance and exemption requests. In addition, EPA will formulate plans to develop regulations on the hardness/softness of drinking water as it relates to cardiovascular disease. EPA will also develop program guidance to assist in the implementation of new organics standards and reporting requirements. In order to expand and clarify regulatory requirements for the underground injection control (UIC) program, technical guidance will be prepared on minimum State program requirements, permit procedures, underground injection methods, construction and monitoring, and Federal program implementation. A report on the ground water contamination potential of surface impoundments will be prepared based upon State data and sole source aquifer petitions and applications for primary enforcement responsibility in the underground injection control program will be reviewed.

Program Description

The Safe Drinking Water Act requires EPA to assure the safety of drinking water through the establishment and implementation of national primary drinking water regulations specifying maximum permissible bacteriological, chemical, and radiological constituent levels required to protect the public health. This requires EPA to determine exposure and health risks of drinking water contaminants and to assess the technology and economic feasibility of controlling these contaminants. Interim primary regulations, which addressed only bacteriological, radiological, and some chemical contaminants, became effective in June 1977. EPA is amending these interim primary regulations with standards for organic contaminants. Based upon the National Academy of Sciences report received by the Agency in May 1977, revised drinking water regulations are being developed. In addition, the Agency is required to promulgate secondary drinking water regulations designed to protect the public welfare.

EPA is also responsible for developing regulations and program guidance for State programs. These programs must ensure that all public water systems comply with the interim primary and revised primary drinking water standards and regulations. In addition, EPA is to establish guidelines and regulations to protect existing and potential drinking water sources from contamination through underground injection practices. Twenty-two States have been designated by the Administrator as requiring underground injection control (UIC) programs. Technical and financial assistance will be provided to these States for the purpose of helping them to achieve primary enforcement responsibility for the UIC program. Additional States will be listed as requiring UIC programs by 1980. As part of the effort to protect underground sources of drinking water, guidelines for the designation of sole source aquifers are being established. Activities to support program developement such as data management, public awareness, special monitoring studies, and toxicological assistance will continue.

DRINKING WATER STANDARDS AND REGULATIONS DEVELOPMENT

1978 Accomplishments

In 1978, EPA proposed regulations for trihalomethanes and synthetic organic chemicals. Eight public hearings were conducted and a total of 595 public comments were received. Revisions were made to the Interim Primary Drinking Water Regulations for bacteriological contaminants, turbidity, sodium monitoring, operation and maintenance. In addition, guidance on variances and exemptions for regional and State implementation of the Interim Primary Drinking Water Regulations was prepared.

Studies initiated during the fiscal year include the evaluation of home water treatment units, the national organics screening study, potential corrosion regulations study, cost of compliance study, and the development of the NATO Drinking Water Pilot Study.

Other notable accomplishments included the development of a joint industry/government program to limit organic chemical impurities present in chlorine used for water disinfection and the completion of the laboratory certification guidance manual.

1979 Program

In 1979, $5,278,600 and 45 positions have been allocated to this program element. Approximately $3.5 million in extramural funds will be utilized for gathering data on drinking water contaminants, evaluation of health effects data, evaluation of technical analysis techniques, economic impact assessment relating to the public water supervision (PWS) and underground injection control (UIC) programs, and the development of automated data processing systems to assist States in program implementation. The 1979 program for standards and regulations development emphasizes the Agency's continuing health protection initiatives through the promulgation of the organics standards. The program will establish maximum contaminant levels (MCL) for organic contaminants. As a result of the National Academy of Sciences report that listed several hundred contaminants that threaten drinking water, an attempt will be made to develop standards to control many of these contaminants. Attention will also be given to other problems, e.g., hardness and softness of water. In addition, economic analyses of these standards and the underground injection control regulations will continue.

Section 1442 of the Safe Drinking Water Act authorizes the Administrator to conduct a variety of special studies dealing with drinking water. Areas of study to be completed during this fiscal year are: (1) the availability of drinking water, (2) cost of compliance, (3) reaction of the chlorine and humic substances, and (4) polychlorinated biphenyls in drinking water.

Sections 1414 and 1416 of the Safe Drinking Water Act require that any State granting a variance or exemption must guarantee the health and safety of the consumer by insuring that all requirements of compliance are met. There will be approximately 180 variances and exemptions issued by the States during 1979 for which technical support will be required.

1979 Explanations of Changes from Budget Estimate

The net increase of +$309,300 results from several actions. A net increase of +$122,500 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. In addition, -$416,100 was transferred from this activity to research and development drinking water activities and +602,900 was reprogrammed to this element from abatement and control public systems support/program assistance drinking water activity for additional contracts to gather health effects data on some of the contaminants identified in the National Academy of Science report prior to the development of regulations.

1980 Plan

EPA has requested $5,220,000 and 45 positions in 1980 for drinking water standards and regulations development. Approximately $3.5 million in extramural funds will be allocated to the gathering of data on drinking water contaminants, evaluating health effects data and technical analysis techniques, conducting an economic impact assessment relating to the PWS and UIC programs, and the development of implementation strategies for these programs. The major objective of the 1980 program will be to develop revised primary drinking water regulations as mandated by the Safe Drinking Water Act. This includes the development of maximum contaminant levels for organic contaminants which will supplement the treatment technology requirements specified in the interim primary drinking water regulations. Technical support will be provided to assist the regions in implementing the organics standards and regulations. In addition, standards will be developed to control the corrosivity of drinking water, and regulations will be developed on the hardness/softness of drinking water as we learn more about its relationship to cardiovascular disease. The issuance of variances and exemptions will again be a program activity with the issuance of approximately 180 variances and exemptions expected to be granted.

STATE PROGRAM GUIDELINES AND REGULATIONS DEVELOPMENT

1978 Accomplishments

Program accomplishments in 1978 for State program guidelines and regulations development fall into two major areas, (1) ground water protection and (2) public water system supervision.

Accomplishments in the ground water protection program included the designation by the Administrator of the initial 22 States requiring an underground injection control program and the completion of a special report entitled, "Surface Impoundments and Their Effects on Ground Water Quality in the U. S. - A Preliminary Survey." In addition, grants were issued to 49 States for the conduct of an assessment of surface impoundments to obtain additional data, six new sole source petitions were reviewed and four previously submitted petitions were approved for designation.

In the public water system supervision program 26 additional States were approved for primary responsibility bringing the total to 40 States. Program guidance was developed for the issuance of variance and exemptions. Public awareness programs and a plan to evaluate program effectiveness were also developed.

1979 Program

The 1979 program for State program guidelines and regulations development will emphasize the promulgation of both the underground injection control regulations and the underground water source protection grants. Approximately $2 million in extramural funds will be used to develop technical guidance to regions for program implementation in nonprimacy states, gather and evaluate data on practices which threaten ground water, establish appropriate control techniques, and develop technical guidance for UIC programs. The sole source regulations will be promulgated and sole source designations will be processed. Activities supporting data management and public participation and awareness will continue for the public water system supervision program and will be initiated for the underground injection control program. In addition, the analytical phase of the rural water survey will be completed. Applications for an additional 10 States, which are expected to assume primacy for the public water system supervision program, will be reviewed. Program effectiveness in nonprimacy States will also be evaluated.

1979 Explanations of Changes from Budget Estimate

The net increase of +$267,100 results from several actions. Congress applied a $3 million reduction for position lapse rate in Abatement and Control and Enforcement appropriations; the decrease applicable to this activity is -$84,200. An increase of +$157,900 results from increased pay costs from the October, 1978 (1979) pay raise as well as distribution of the October, 1979 (1978) pay raise. Finally, as part of the Agency's ZBB review of resource requirements for its 1979 operating plan, +$193,400 was reprogrammed to this activity from the drinking water underground injection control program ($70,700) and public systems support and program assistance ($102,700).

1980 Plan

In 1980, $4 million and 58 positions are requested for this program. Approximately $2 million in extramural funds will be utilized to continue those activities undertaken in 1979. The program will continue to provide guidance on implementation of the UIC program as well as public participation and awareness, data management, and ground water protection activities relating to the UIC program. The review of sole source aquifer petitions will also continue. New activities will include the review of State primacy applications for the UIC program, the designation of additional States as requiring UIC programs, and the implementation of a data management system for the underground injection control program. The PWS program will focus on continued oversight of regional operations in the primacy States and full program implementation in nonprimacy States, including interstate carrier conveyances, Indian lands, and Federal facilities.

DRINKING WATER

Abatement and Control

State Program Resource Assistance

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Public Water Systems Supervision Program Grants.....	$19,644	$26,400	$26,400	$29,450	+$3,050
Underground Injection Control Grants.....	...	7,600	7,600	7,795	+195
Special Studies and Demonstrations.....	452	2,000	2,000	1,400	-600
Drinking Water Training	388	...	270	150	-120
Total.....	20,484	36,000	36,270	38,795	+2,525
Permanent Positions....	...	...	...	...	...
Full-time Equivalency					
Public Water Systems Supervision Program Grants.....	...	...	2	...	-2
Underground Injection Control Grants.....	...	...	...	...	...
Special Studies and Demonstrations.....	...	...	...	...	...
Drinking Water Training	...	...	...	...	...
Total.....	...	...	2	...	-2

Budget Request

The 1980 request of $38,795,000 represents an increase of $2,525,000 over the 1979 request. The funds will be distributed in the form of grants to States to assist them in acquiring and implementing primary enforcement responsibility for the public water system supervision program and the underground injection control program. Grants will also be provided to the State associations of rural water districts to provide training and technical assistance to small rural water systems. In addition, fellowships and institutional grants will be awarded to upgrade professional personnel resources in the drinking water field.

Program Description

Under the Safe Drinking Water Act, the States have the primary responsibility for implementation of the public water system supervision and the underground injection control programs. The Congress, however, in recognizing that the States would require financial assistance, have appropriated funds to develop and maintain programs that would satisfy the minimum requirements of regulations designed to protect public health and underground sources of drinking water. In the public water system supervision program, States with primary enforcement responsibility and those that are making a diligent effort to assume some responsibility will be eligible for their individual allocation pursuant to the Safe Drinking Water Act Amendments of 1977. In the underground injection control program, a designated State must assume primacy within two years after the date of the initial grant award to be eligible to continue to receive funding. These assistance programs are a means to strengthen the cooperative relationship

between the Federal and State governments. It is intended that through this arrangement the States will be better able to assume and maintain primary responsibility for assuring the protection of the public health and underground sources of drinking water.

Other program areas include financial assistance to support special projects directed at rural water systems and academic training which includes fellowships and institutional grants.

PUBLIC WATER SYSTEM SUPERVISION PROGRAM GRANTS

1978 Accomplishments

Pursuant to the Safe Drinking Water Act Amendments of 1977, public water system supervision program grants totalling $19,643,600 were awarded to 48 States that had either assumed primacy or were making diligent efforts to assume primary. Federal grant dollars were spent by the States for salaries of new staff and for purchasing new equipment for full implementation of the Interim Primary Drinking Water Regulations. As a result as this assistance, 26 additional States were approved for primacy during 1978, bringing the total to 40 States.

1979 Program

During 1979, $26,400,000 will be available to the States that assumed primary enforcement responsibility. Those that are making a diligent effort and substantial progress to achieve primacy will be eligible to receive up to 75 percent of their fiscal year allocation, with the remaining 25 percent to be awarded to the State if it assumes primacy during the year. A major portion of these grant funds will be used to pay salaries of program employees. The remaining grant dollars will be spent for data management, public notification, laboratory certification, and training activities. It is anticipated that an additional 10 States will attain primacy in 1979.

1979 Explaination of Changes from Budget Estimate

There is no change from the budget estimate.

1980 Program

In 1980, $29,450,000 is requested for this program element. This represents an increase of $3,050,000 which will enable primacy States to maintain a constant level of effort as well as provide funding for additional States who assume primacy. The increase in grant funds will also support increased State activities associated with noncommunity systems and the implementation of the organics regulation. Grants will be available only to the States which have assumed primacy. In addition, the funds will be used to maintain ongoing program activities such as administration, surveillance and technical assistance, data management, enforcement, and public notification.

UNDERGROUND INJECTION CONTROL PROGRAM GRANTS

1978 Accomplishments

Funds for the underground injection control grants were not obligated due to the delay in reproposing and promulgating applicable program regulations.

1979 Program

The 1979 appropriation of $7,600,000 will be available to those States designated by the Administrator as requiring underground injection control programs. The funds will be used to establish the institutional framework for the program, and to develop a program which includes conducting inventories of injection facilities, hiring of personnel, permitting of new and existing facilities, and monitoring which will enhance the States' ability to assume primary enforcement responsibility.

1979 Explanation of Changes from Budget Estimate

There is no change from the budget estimate.

1980 Program

A request of $7,795,000 is being made for this program in 1980 and represents an increase of $195,000 over the 1979 request. The funds will be issued to the States that the Administrator designates as requiring an underground injection control program (UIC) and will support the State implementation activities of the UIC program.

SPECIAL STUDIES AND DEMONSTRATIONS

1978 Accomplishments

Grants totalling $452,300 were awarded to the National Rural Water Association for continuing efforts in developing and demonstrating training programs to assist 11 rural water districts, including incorporated areas, in complying with the provisions of the Safe Drinking Water Act.

1979 Program

In 1979, $2 million was appropriated to continue providing grants to the State rural water associations to assist them in providing training and technical assistance to the small rural water systems.

1979 Explanation Changes from Budget Estimate

There is no change from the budget estimate.

1980 Program

In 1980, $1,400,000 is requested for this program. The funds will be used to maintain support to rural water districts for training, technical assistance, public awareness projects, and special studies.

DRINKING WATER TRAINING GRANTS

1978 Accomplishments

An allocation of $400,000 in grants was awarded for academic training and related activities. Twenty-three professional education grants and 32 fellowships were awarded for academic training of State drinking water regulatory personnel.

1979 Program

In 1979, this activitiy provides $270,000 to be used to fund seven institutional grants ($70,000) and to fund 30 fellowships for continued training in the drinking water field ($200,000).

1979 Explanation of Changes from Budget Estimate

The increase of +$270,000 results from a congressional add-on for academic training.

1980 Program

In 1980, $150,000 is being requested for this program. Funds will be used to grant 30 fellowships for continued training of personnel in the drinking water field.

DRINKING WATER

Abatement and Control

Drinking Water Management

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
	(dollars in thousands)				
Appropriation					
Drinking Water Management-Public Water System.....	$3,851	$6,572	$5,627	$8,085	+$2,458
Drinking Water Management-Ground Water Protection	2,816	1,750	1,139	1,715	+576
Total.....	6,667	8,322	6,766	9,800	+3,034
Permanent Positions					
Drinking Water Management-Public Water System.....	132	239	217	217	...
Drinking Water Management-Ground Water Protection	19	64	47	47	...
Total.....	151	303	264	264	...
Full-time Equivalency					
Drinking Water Management-Public Water System.....	...	...	229	228	-1
Drinking Water Management-Ground Water Protection	...	...	44	48	+4
Total.....	...	...	273	276	+3

Budget Request

An appropriation of $9,800,000 and 264 positions is requested for 1980. This represents an increase of $3,034,100 with no change in positions from the 1979 current estimate. The increase will be used to upgrade EPA laboratories to meet the highest priority demands for support of regional programs including analysis of drinking water in areas with populations of more than 75,000; integrated toxics monitoring for selected substances; compliance monitoring of major industrial permittees; emergency response for hazardous materials; quality assurance; and effluent guidelines development activities for selected industries. Emphasis will also be placed on initiating new activities for the public water system supervision program including implementation of the organics standards through continued guidance to the States, and incorporation of noncommunity water systems in the program. EPA will continue oversight of States with primary enforcement responsibility for the public water systems and will continue implementation of the program in States which have refused to accept primary enforcement responsibility. The activities of the ground water protection program include the implementation of the sole source aquifer regulations and technical assistance to the States in the development and implementation of underground injection control (UIC) programs. The UIC program activities include the conduct of inventories and assessments of injection facilities, the designation of aquifers which are also drinking water sources, the issuance of permits, establishment of special ground water protection studies, and implementation of training and public awareness programs.

Program Description

Under the Safe Drinking Water Act, Congress intended that States would be primarily responsible for assuring the safety of drinking water and the protection of underground sources of drinking water. The role of the Federal Government is to provide technical assistance to the States in the development of the public water system supervision and the underground injection control programs. To assist States in developing and implementing these programs, EPA personnel provide guidance on the interpretation of regulatory requirements and specify the minimum requirements for primary enforcement responsibility. In the event that States are unable or unwilling to assume responsibility for either the public water system supervision or the underground injection control programs, EPA must develop and administer control strategies and programs. This includes monitoring and surveillance activities as well as recordkeeping responsibility. In addition, EPA is required to establish and implement similar programs on Indian reservations, for interstate carrier conveyances in the public water system program, and Federal facilities in nonprimacy States. Drinking water management activities for the public water system supervision programs include implementation of Federal responsibilities in those States that do not intend to assume primacy, the oversight of States with primacy, review of variances and exemptions, and assistance in the implementation of the organics standards. The drinking water management activities for the ground water protection program at this time are confined to technical assistance activities which will enable States listed as requiring UIC programs to achieve primacy, oversight of the State assessments of surface impoundments, and technical evaluations of petitions for sole source aquifer designations. The activities for this program will increase substantially as the States or EPA implement the UIC program.

DRINKING WATER MANAGEMENT - PUBLIC WATER SYSTEMS

1978 Accomplishments

Twenty-six additional States assumed primary enforcement responsibility in 1978, bringing the total to 40 States. For the 17 States which elected not to accept primacy, programs were established and implemented by EPA to ensure that Federal standards were being maintained and the public health protected. Approximately 10 States are continuing their efforts to assume primacy and have entered into cooperative agreements with EPA for implementation until such time as the States assume primacy. Public notification was used extensively in several States--primacy and nonprimacy--to inform consumers of problems associated with public water system deficiencies and failure to meet the requirements of the Interim Primary Drinking Water Regulations.

1979 Program

The drinking water management - public water system supervision program is allocated $5,627,300 and 217 positions. The resources are intended to provide oversight of State implementation, to implement Federal responsibility in nonprimacy States, on Indian lands, for interstate carriers, and on Federal facilities in nonprimacy States, and to continue to encourage nonprimacy States to assume primacy. It is estimated that approximately 10 additional States will achieve primacy during 1979. New activities related to the implementation of the organics regulations, and to the inclusion of noncommunity systems will also be initiated. Assistance will be provided to the States in the issuance of variances and exemptions and the establishment of compliance schedules.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$944,200 results from several actions. The Congress applied a $3 million reduction for position lapse in the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$218,600. A net increase of +$590,600 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. Finally, as part of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$1,316,200 was reprogrammed from this activity to drinking water State program guidelines and regulation development ($102,700) and to agency management activity ($1,213,500).

1980 Program

The 1980 request for this program is $8,085,000 and 217 positions. This represents an increase of $2,457,700 with no change in positions from the 1979 program. Approximately $1,300,000 will be used to upgrade EPA laboratories to meet the highest priority demands for support of regional programs including analysis of drinking water in areas with populations of more than 75,000; integrated toxics monitoring for selected substances; compliance monitoring of major industrial permittees; emergency response for hazardous materials; quality assurance; and effluent guidelines development activities for selected industries. The remaining increase of $1,200,000 will be used to initiate new activities for the public water system supervision program including implementation of the organics standards through continued guidance to the States, and incorporation of noncommunity water systems in the program. Continuing program activities include the operation of public water system programs in nonprimacy States, Indian lands, interstate carrier conveyances, and Federal facilities in nonprimacy States, program oversight in the primacy States, and assistance to States in implementing the organics regulations. In addition, data management, issuance of variances and exemptions, and the review of plans and specifications for granular activated carbon water treatment facilities will continue.

DRINKING WATER MANAGEMENT - GROUND WATER PROTECTION

1978 Accomplishments

Drinking water management - ground water protection program activities centered on working with the States on the conduct of the surface impoundment assessment, responding to a ground water contamination problem and reviewing sole source aquifer petitions.

The regions awarded grants to 49 States for the conduct of an assessment of surface impoundments to determine the ground water contamination potential from these sources. The assessment will be completed by June 1980.

The EPA regional office responded to a ground water contamination threat in West Plains, Missouri, resulting from 25 million gallons of raw sewage seeping into the ground water after a lagoon failure. EPA and other Federal agencies conducted tests to determine the severity of the spill and analyzed water samples to ensure the protection of the public's health.

Regional activities for the sole source aquifer program included the designation of four sole source aquifers for which Federal financial assistance for projects must be reviewed. In addition, regions started their review of six new petitions for designations.

1979 Program

The drinking water management - ground water protection program is allocated $1,138,600 and 47 positions. The 1979 program activities will concentrate on the sole source aquifer program, underground injection control program, general emergency response capability, and ground water related projects to be undertaken during the fiscal year.

The sole source aquifer program activities involve the review and processing of sole source aquifer petitions and the review of projects proposed in a designated sole source area. It is estimated that nine petitions will be received during 1979.

Technical assistance will be provided by the regions to the designated States to encourage the States to assume primary enforcement responsibility for the underground injection control program.

The regions will maintain an emergency response capability to provide technical assistance and other support to protect the public health and welfare in affected areas.

1979 Explanation of Changes from Budget Estimate

The net decrease of -$611,400 results from several actions. First, Congress applied a $3 million reduction for positon lapse rate to the Abatement and Control and Enforcement appropriations; the decrease applicable to this activity was -$45,000. Secondly, an increase of +$128,000 results from increased pay costs from the October 1978 (1979) pay raise as well as distribution of the October 1977 (1978) pay raise. Finally, as part of the Agency's ZBB review of resource requirements for its 1979 operating plan, -$693,600 was reprogrammed from this activity to other drinking water abatement and control activities, as follows: standards and regulations development ($602,900) and State program guidelines and regulations development ($90,700).

1980 Program

The 1980 request for this program is for $1,715,000 and 47 positions. This represents an increase of $576,400 with no change in positions from the 1979 estimate. Program activity will focus on the sole source aquifer program, the development of an underground injection control program for those States which do not intend to assume primacy, technical assistance and guidance to States seeking primacy, and the implementation of training and public awareness programs.

Activities in the sole source aquifer program will include review and processing of sole source aquifer petitions and review of proposed projects in designated sole source areas. An estimated eleven petitions will be received during 1980.

Plans will be formulated for total or partial EPA implementation of UIC programs in those States which are unable or unwilling to assume primary enforcement responsibility. For those States that are actively seeking primacy, the regions will continue to provide technical assistance and guidance to help the States develop and implement their own programs.

As an inducement to both the States seeking primacy and the States which are reluctant in seeking their own programs, the regions will be developing training and public awareness programs. This effort will help to create public concern for the merits of ground water protection.

Enforcement

Enforcement

	Actual 1978	Budget Estimate 1979	Current Estimate 1979	Estimate 1980	Increase + Decrease - 1980 vs. 1979
			(dollars in thousands)		
Appropriation					
Drinking Water Enforcement.....	$202	$961	$729	$835	+$106
Permanent Positions					
Drinking Water Enforcement.....	7	43	32	31	-1
Full-time Equivalency					
Drinking Water Enforcement.....	...	...	33	34	+1

Budget Request

An appropriation of $835,000 and 31 positions is requested for 1980, and increase of $106,000 and a decrease of one position from 1979.

Program Description

The Safe Drinking Water Act of 1974, as amended, provides the statutory requirements for a Federal/State drinking water program. The Act provides for assurance of the safety of drinking water through two mechanisms: the establishment and enforcement of Primary Drinking Water Regulations which specify the maximum allowable levels of drinking water contaminants and the establishment and enforcement of underground injection control (UIC) regulations for protection of underground drinking water supplies.

With regard to Primary Drinking Water Regulations, the Act provides for State assumption of the drinking water program, but requires EPA to implement the program in States that have not received primary enforcement responsibility (primacy). The drinking water enforcement public water system (PWS) implementation program encompasses activities related to issuance of variances and exemptions (where EPA has primacy) to PWS not in compliance with Primary Drinking Water Regulations; the investigation and initiation of civil or criminal actions for violations or Primary Drinking Water Regulations in States without primacy and in States that have primacy but have requested EPA assistance; the overview of variances and exemptions issued and enforcement action taken by States with primacy; and emergency enforcement actions.

With regard to underground injection control, the Act provides for assumption of the UIC program by those States designated as needing such a program. EPA is required to implement a UIC program in designated States that have not received primacy. The drinking water enforcement UIC program in EPA primacy areas encompasses activities related to issuance of UIC permits to facilities disposing of wastes underground; the investigation and initiation of civil and criminal actions for violations of the UIC regulations; and emergency enforcement responses.

During 1978, resources were used for case-follow-up to an emergency situation which occurred in 1977. This involved a carbon tetrachloride discharge which affected public water supplies along the Ohio River. Follow-up activity to the emergency response primarily involved participation in investigations for determining the possibility of criminal action and in case preparation for a criminal case court action.

Drinking water enforcement activities also included technical and legal support in the development and review of proposed Primary and Secondary Drinking Water Standards; development of an enforcement program for implementing public water systems program regulations convering issuance of variances and exemptions; and initiation of enforcement actions, where necessary, against public water systems.

1979 Program

Fiscal year 1979 resources for the drinking water enforcement program are $729,000 and 32 positions. During 1979, the highest priority of the drinking water enforcement program will be enforcement response to emergency drinking water situations that involve imminent and substantial endangerment to public health and safety. The program will also focus on issuing variances and exemptions, approximately 180, where EPA has primacy, to public water systems that are not in compliance with Primary Drinking Water Regulations and initiating enforcement actions, where necessary, to assure compliance with the requirements of the Act. An estimated 20 enforcement actions will be undertaken for violations of the regulations by public water systems in States without primacy and in States that have primacy but have requested EPA assistance.

Additional resources will be devoted to overviewing State public water supply primacy programs and preparing program guidance for issuance of variances and exemptions, and for initiating enforcement actions.

Explanation of Changes from Budget Estimate

The net decrease of -$232,000 results from several actions. First, Congress applied a $3 million reduction for position lapse rate to the Abatement and Control and Enforcement appropriations; -$72,600 was applies to this activity. Second, an increase of +$83,000 is due to increased pay costs associated with the October 1978 (1979) pay raise and the distribution of the October 1977 (1978) pay raise. Finally, as a result of the Agency's ZBB review of resource requirements for its 1979 operating plan -$242,000 was reprogrammed from this element within regions and is attributed to regional increases in mobile source enforcement ($121,100) and water quality enforcement ($121,300).

1980 Program

In 1980, the request is for $835,000 and 31 positions, an increase of $106,000 and a decrease of one position from 1979.

During 1980, the highest priority of the drinking water enforcement program will be enforcement response to emergency drinking water situations that involve imminent and substantial endangerment to public health and safety. Drinking water enforcement will also focus on two programs: public water system implementation and underground injection control (UIC). For the public water system implementation program, activities will include issuance of additional variances and exemptions, approximately 180; continued support of enforcement proceedings initiated in 1979; initiation of new enforcement actions, approximately 20, and review of State primacy programs. Activities will also include issuance of Notices of Violations to States with primacy that have not adequately enforced provisions of the Act. A UIC program will be in its development stage during 1980, and it is anticipated that drinking water enforcement will begin issuing on the order of 50 permits and initiating appropriate enforcement actions to bring permittees in compliance with UIC program requirements.