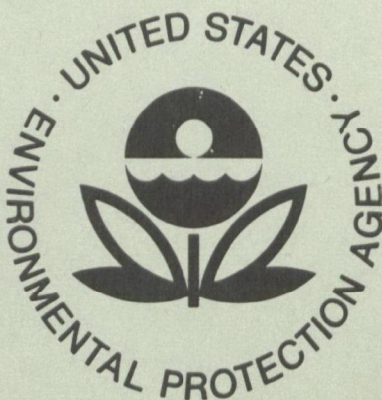


OFFICE OF
RESEARCH AND DEVELOPMENT

REGION I

ANNUAL REPORT



U.S. Environmental Protection Agency
Region I
John F. Kennedy Federal Building
Boston, Massachusetts 02203

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OFFICE OF RESEARCH AND DEVELOPMENT
REGION I
ANNUAL REPORT

Prepared by

U. S. Environmental Protection Agency
Office of Research and Development
John F. Kennedy Federal Building
Boston, Massachusetts 02203

Helen M. McCammon, Ph. D. - Director
Marjorie A. Drucker - Air Pollution and Health Effects Research
Richard R. Keppler - Energy Related Research
Leah L. Palmer - Grant and Contract Control; Secretary

June 1975

FORWARD

This is the second annual report from the Office of Research and Development in Region I. The purpose of the report is to review and highlight events that are considered to be of interest, and to present information on grants and contracts awarded during the past fiscal year.

If more information is desired about any grant or contract, as well as any items mentioned in the report, please feel free to call our office at (617)223-3477.

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INTRODUCTION

During the past year many noteworthy events took place in the Environmental Protection Agency's Office of Research and Development. The most significant event was the appointment of a new Assistant Administrator for Research and Development, Dr. Wilson K. Talley. The second major event was the reorganization of OR&D. Through all this change, the Region I Office of Research and Development has maintained its ongoing program of acting as the extension of OR&D in the region. We continue to inform the user community of past, ongoing, and contemplated research activity, and to assist the users in every way possible for maximizing contact with OR&D in Washington, D.C. and the various EPA laboratories.

A bibliography of OR&D research reports is published periodically and can be obtained from our office upon request. Some of the recent research reports are also available for distribution. A complete set of reports is available in the EPA-Region I library.

A report which may be helpful as an initial introduction to the grants and contracts system is entitled EXPRO, a listing of extramural projects to be funded in the fiscal year. EXPRO outlines procedures for application for grant and contract support and also lists specific program

areas which OR&D is funding. EXPRO may be obtained from headquarters or our office. Additionally, we encourage the research community to get in touch with the regional office about specific details on current OR&D procedures and objectives. This information can often save time and effort for the applicant by highlighting recent changes that may have occurred in the R&D program.

OR&D REORGANIZATION

Dr. Wilson K. Talley, a nuclear physicist, was appointed Assistant Administrator for Research and Development in January 1975, leaving his former position as Study Director of the Commission on Critical choices for Americans. Dr. Talley has reorganized OR&D to simplify and streamline program planning and implementation. Headquarters activity will be focused on long range planning and review, and coordination within and outside of EPA. The fifteen field laboratories will be directly involved with program implementation.

Because the reorganization of the Office of Research and Development has been so extensive, we felt it would be helpful to include an organization chart for ready reference (Figure I).

OR&D will now consist of four program offices: the Office of Monitoring and Technical Support; Office of Energy, Minerals and Industry; Office of Air, Land and Water Uses; and Office of Health and Ecological Effects.

The Office of Monitoring and Technical Support plans and manages technical support for program and regional offices in areas of advanced monitoring systems, equipment and techniques, and quality assurance. It is responsible

for transfer of technology and information generated by OR&D to user communities. It also manages laboratory and staff development programs, as well as such programs as Minority Institutions Research Support.

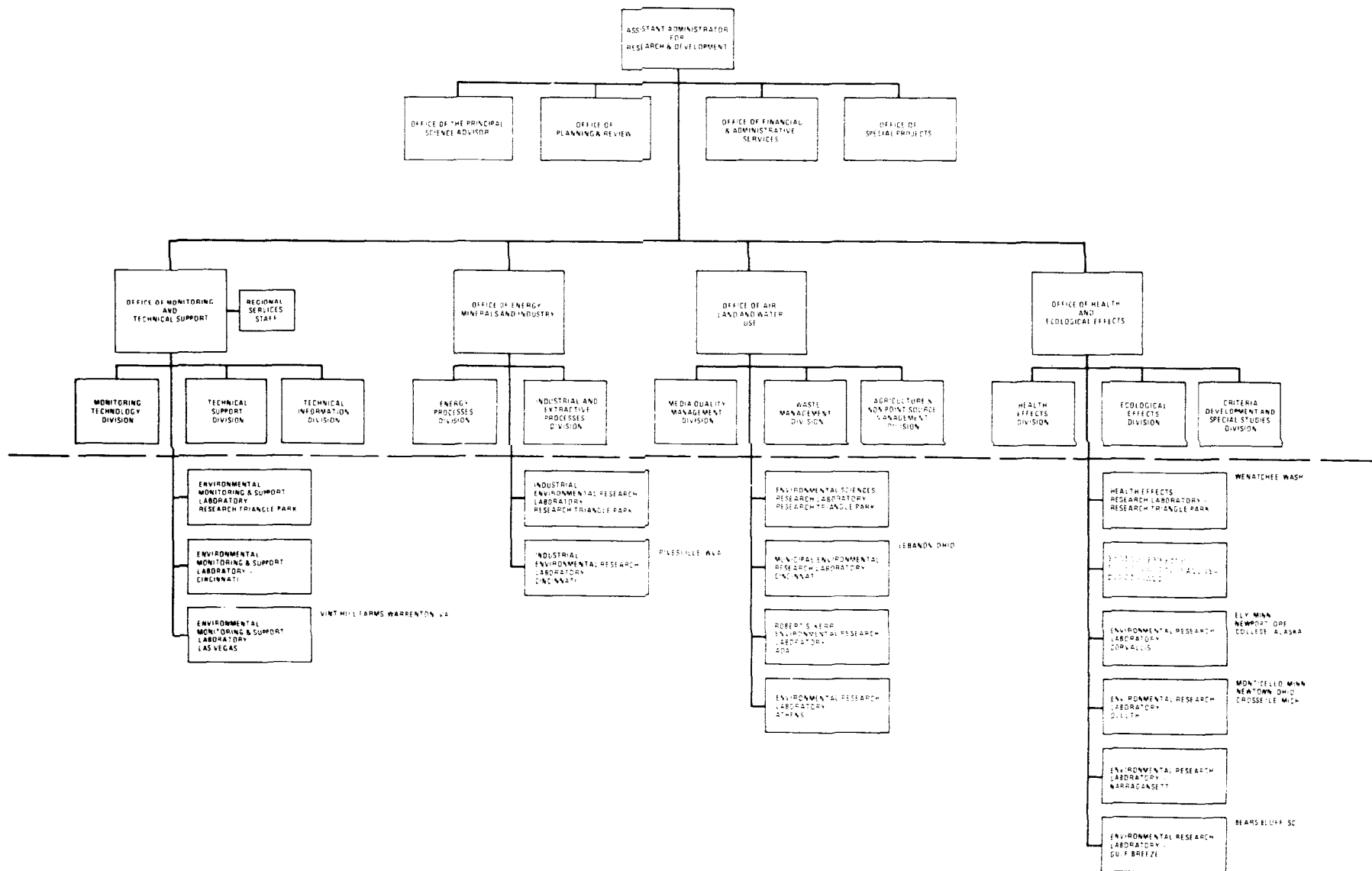
The Office of Energy, Mineral Resources, and Industry plans and manages programs related to the environmental aspects of energy, mineral and industrial resources development. It also is responsible for assessing the environmental impact of developing and using energy, mineral, and industrial resources, including economic and siting considerations. It will identify, develop, demonstrate and assess suitable control technologies.

The Office of Land, Water and Air Use plans and manages programs in areas of land, air and water quality. It is responsible for such problem areas as waste disposal, water supply, agricultural chemicals, urban air and noise pollution, recreational problems, land use, and toxic and hazardous materials. It will manage research on pollutant characterization and transport, and advanced measurement techniques, equipment and procedures.

The Office of Health and Ecological Effects plans and manages research programs on long and short term effects of pollutants and classes of pollutants, acting singly or in

combination, on man and his environment. This office will also identify, develop and evaluate data for the establishment of environmental quality standards and guidelines. It will also conduct broad multimedia and intermedia studies including socioeconomic effects.

Fig. I. EPA OFFICE OF RESEARCH AND DEVELOPMENT ORGANIZATION CHART



OR&D BUDGET

OR&D funds have varied slightly from year to year since EPA was first established. However, the surfacing of the energy crisis caused a significant jump in funding for energy related research in the last two years (Table 1). The FY75 budget for research in EPA was \$284 million. Of this allocation, \$130 million was for energy research and \$154 million was for the remaining OR&D programs. The budget for energy research was divided between control technology (\$81 million) and health and ecological effects (\$49 million).

Distribution of the total resources for the year was twenty-four percent for inhouse research, 53 percent for extramural grants and contracts, and 23 percent was shared with other Federal agencies through interagency agreements.

During the year, the House Subcommittee on the Environment held hearings on OR&D funds and voted to restore twenty-five million dollars to the FY75 budget. Of this amount, the major portion, \$10 million, was allocated for research on cost reduction in construction and operation of municipal treatment plants. The other major allocation of \$8 million went for research on stationary source control technology and emissions from catalytic converters.

TABLE I

Total R&D Budget

<u>Year</u>	<u>Resources (\$ million)</u>	<u>Manpower</u>
1972	162	----
1973	176	1907
1974	177 ^a	1863
1975	284 ^b	1800
1976 (estimated)	275 ^c	?

^aincludes \$19 million for energy

^bincludes \$130 million for energy

^cincludes \$112 million for energy

Because of the reorganization, EPA research laboratories will have a major role in program implementation. The approximate resources for each of the newly organized laboratories for FY75 are:

Office of Monitoring and Technical Support

Monitoring and Support Laboratory, RTP, North Carolina	\$5 million
Monitoring and Support Laboratory, Cincinnati, Ohio	\$3 million
Monitoring and Support Laboratory, Las Vegas, Nevada	\$5 million

Office of Energy, Minerals and Industry

Industrial Research Laboratory, RTP, North Carolina	\$3 million
Industrial Research Laboratory, Cincinnati, Ohio	\$15 million

Office of Land, Water and Air Use

Municipal Research Laboratory, Cincinnati, Ohio	\$20 million
Environmental Research Laboratory, RTP, North Carolina	\$22 million
Environmental Research Laboratory, Athens, Georgia	\$6 million
R. S. Kerr Research Laboratory, Ada, Oklahoma	\$8 million

Office of Health and Ecological Effects

Health Effects Research Laboratory, RTP, North Carolina	\$28 million
Health Effects Research Laboratory, Cincinnati, Ohio	\$6 million
Environmental Research Laboratory, Corvallis, Oregon	\$11 million
Environmental Research Laboratory, Narragansett, RI	\$6 million
Environmental Research Laboratory, Gulf Breeze, Florida	\$3 million
Environmental Research Laboratory, Duluth, Minnesota	\$6 million

OTHER FEDERAL ENVIRONMENTAL RESEARCH PROGRAMS

EPA supports slightly less than one fifth of the environmental research funded by the Federal government. Other agencies involved with environmental research include the Departments of Interior, Defense, Commerce, Agriculture, Transportation, Health, Education and Welfare, and Housing and Urban Development, the National Science Foundation and National Aeronautics and Space Administration.

The event of the year for the research community was the establishment of the Energy Research and Development Administration (ERDA) on January 19, 1975, in accordance with provisions of the Energy Reorganization Act of 1974. Dr. Robert C. Seamans, Jr., was appointed administrator of this agency.

The program areas of research in ERDA are: (1) fossil energy, (2) nuclear energy, (3) conservation, (4) national security, (5) solar, geothermal and advanced energy systems, and (6) environment and safety.

Although some major programs from several agencies were

merged to form ERDA, EPA was required to transfer only its new automotive power systems and alternate fuel programs which included the \$5 million allocated for this research. Of the \$3.6 billion budget for FY75, ERDA received the major portion from its predecessor the Atomic Energy Commission.

Guidance for preparing proposals you may wish to submit to ERDA is provided by two publications: (1) "Guide for Submission of Research Proposals from Educational Institutions," U.S. AEC, September 1972, and (2) "Guide for the Submission of Research and Development Proposals, Individuals and Organizations." These publications may be requested from Proposal Processing Office, ERDA, Room 1114, 1800 G Street, N.W., Washington, D. C. 20545.

If you have questions concerning ERDA or other Federal agencies involved with environmental research, and are unable to obtain the information on your own, our office will do our best to assist you in obtaining answers to your requests.

OR&D IN REGION I

The research community in Region I is one of the most highly respected in the country. EPA recognizes the wealth of experience and knowledge of these researchers and because of this, although New England is among the smallest of the ten regions, it has one of the highest levels of EPA research grant and contract funding.

In order to facilitate review of funding and to provide immediate reference to the grants and contracts which have been awarded to Region I, figures and tables have been prepared, and appendices are included that list the grants and contracts.

Table II lists the total amounts of R&D grant and contract awards to all regions during fiscal year 1974 and Figure II illustrates the results graphically. Awards of \$12,157,832 to Region I comprised 11 percent of the national total. Based on the 1970 census, Region I had the highest per capita award, which was \$1.03. We anticipate that at the present level of funding activity, FY75 should be even more successful for Region I.

Table III and Figure III breakdown Region I's total awards by state. The proportions of these awards can be seen in Figure III. Massachusetts had the highest total of state

awards, followed by Connecticut, Rhode Island, Maine and Vermont. Although New Hampshire is shown as not having received research funds in FY74, several excellent proposals are being reviewed and we feel confident this lack of funding will be corrected soon.

Totals for research and development grants awarded in Region I during fiscal years 1973 and 1974 are contained in Table IV. There was an overall regional increase of \$218,666 which amounted to an increase of 15 percent. The actual percentage increase in grant awards was much greater, but due to rather unusual circumstances one grant was withdrawn causing a much smaller net increase in grant awards over the past year. The grant to the Paris-Worcester Corporation for \$299,000 for research on producing paperboard from a dry-form process using recycled waste without water was terminated after only a brief life. The unavailability of a patented process critical to the project necessitated termination of the promising research. Figure IV compares the amount of grants awarded to Region I over the last three years. The increase in grant funding since 1972 has been 22 percent.

Table V shows state totals for research contracts for FY73 and FY74. The states fall into the same order with contracts as with grants. Although the increase in contract funding in FY74 over FY73 was 12.8 percent, over the last

three years the increase has been 88 percent. This increase is shown graphically in Figure V. The substantial increase in contracts reflects a change in emphasis in OR&D in FY73 as more research was carried out under contract rather than grant agreements.

Appendices I and II list the titles and recipients of grant and contract awards in Region I during fiscal year 1974. The length of project time may vary, but in all cases the amount of the award corresponds to the project period listed. Grant and contract numbers have been included for further reference or inquiries concerning the projects.

TABLE II

RESEARCH AND DEMONSTRATION
GRANT AND CONTRACT AWARDS
TO ALL REGIONS
DURING FISCAL YEAR 1974

<u>Region</u>	<u>Total Awards</u>	<u>% of Total</u>	<u>Approximate Per Capita*</u>
I	\$ 12,157,832	11	\$ 1.03
II	7,289,266	7	0.29
III	17,743,493	16	0.76
IV	9,716,267	9	0.31
V	19,217,078	17	0.44
VI	5,180,073	5	0.25
VII	8,272,482	7	0.74
VIII	3,095,835	3	0.56
IX	23,059,782	21	1.01
X	<u>3,939,138</u>	<u>4</u>	<u>0.52</u>
TOTAL AWARDS	<u>\$109,671,246</u>	<u>100 %</u>	

*based on 1970 census

FIG. II

RESEARCH AND DEMONSTRATION GRANT
AND CONTRACT AWARDS TO ALL REGIONS,
FY 1974

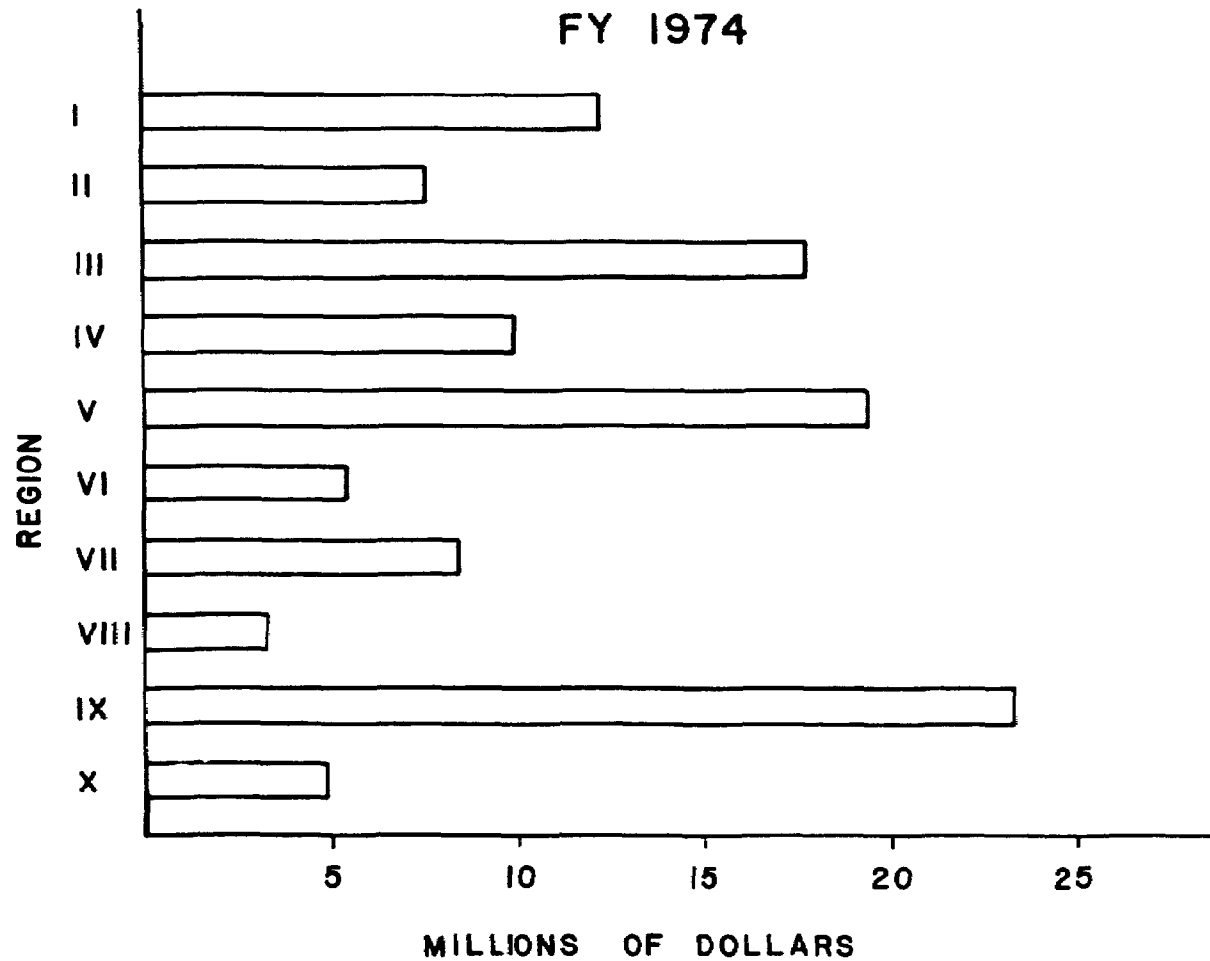


TABLE III

RESEARCH AND DEMONSTRATION
GRANT AND CONTRACT AWARDS
TO REGION I
DURING FISCAL YEAR 1974

<u>State</u>	<u>Grants</u>	<u>Contracts</u>	<u>Total Awards</u>
Connecticut	\$ 214,679	\$ 2,384,842	\$ 2,599,521
Maine	301,239	39,616	340,855
Massachusetts	882,151	7,404,616	8,286,767
New Hampshire	---	---	---
Rhode Island	226,587	633,102	859,689
Vermont	<u>50,000</u>	<u>21,000</u>	<u>71,000</u>
TOTALS	<u>\$1,674,656</u>	<u>\$10,483,176</u>	<u>\$12,157,832</u>

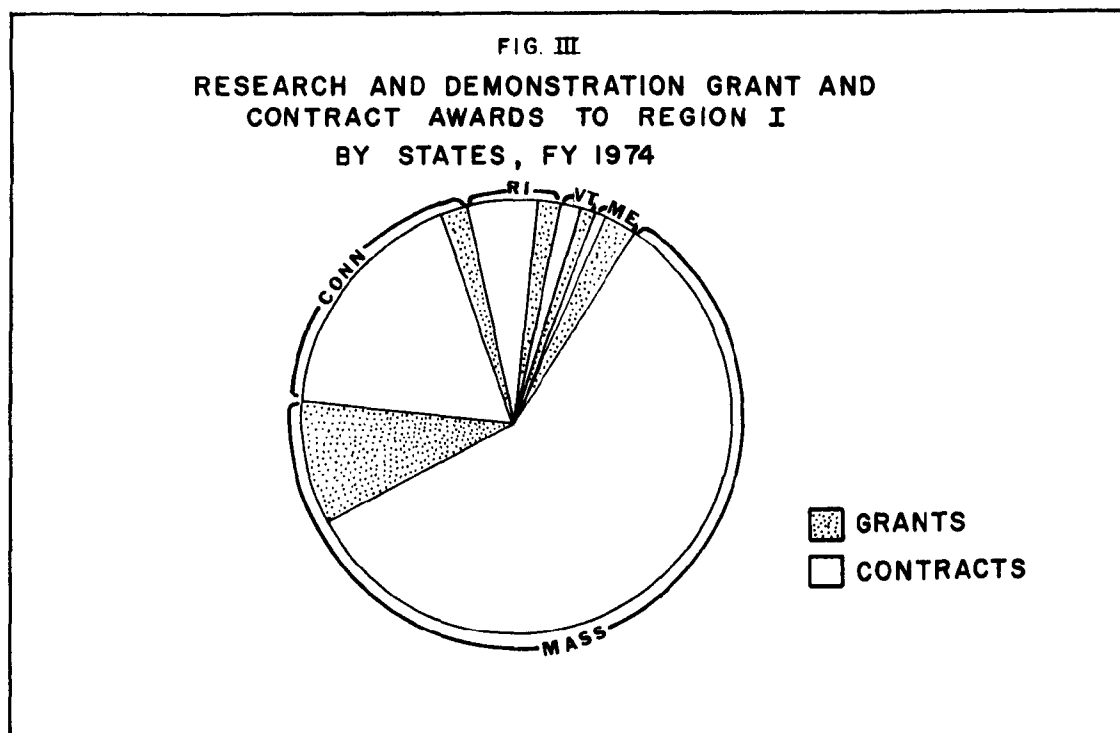


TABLE IV

RESEARCH AND DEMONSTRATION GRANTS
AWARDED TO REGION I

FISCAL YEARS 1973 and 1974

<u>State</u>	<u>FY73 Total</u>	<u>FY74 Total</u>
Connecticut	\$ 250,045	\$ 214,679
Maine	59,520	301,239
Massachusetts	1,018,514	882,151
New Hampshire	16,868	---
Rhode Island	72,655	226,587
Vermont	<u>43,273</u>	<u>50,000</u>
TOTAL	<u>\$1,460,875</u>	<u>\$1,674,656</u>

FIG. IV

THREE YEAR COMPARISON OF R & D
GRANT AWARDS TO REGION I

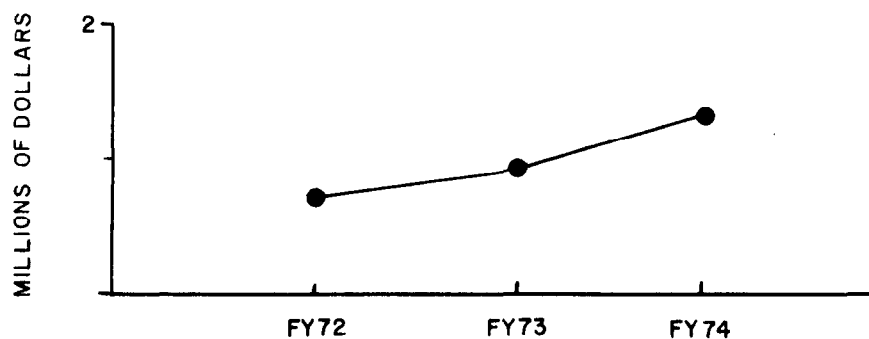


TABLE V

RESEARCH CONTRACTS
AWARDED TO REGION I

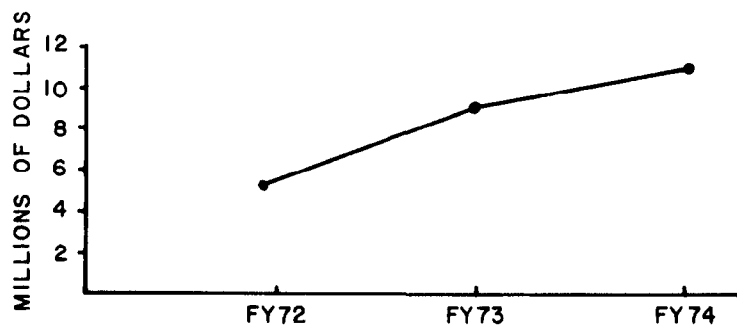
FISCAL YEARS 1973 and 1974

<u>State</u>	<u>FY73 Total</u>	<u>FY74 Total</u>
Connecticut	\$ 940,799	\$ 2,384,842
Maine	82,350	39,616
Massachusetts	7,874,836	7,404,616
New Hampshire	16,000	---
Rhode Island	379,286	633,102
Vermont	---	21,000
TOTAL	<u>\$9,293,271</u>	<u>\$10,483,176</u>

TOTAL INCREASE: 12.8%

FIG. V

THREE YEAR COMPARISON OF R & D
CONTRACT AWARDS TO REGION I



GRANTS AWARDED
to REGION I

GRANTS

<u>GRANTEE</u>	<u>TITLE</u>	<u>GRANT PERIOD</u>	<u>AMOUNT</u>
<u>Connecticut</u>			
University of Connecticut	Selective Medium for Candida Albicans (802827)	1 year	\$ 7,244
Anaconda American Brass Company	Study of Copper Recovery from Brass Mill Effluent (803226)	2 years	17,573
University of Connecticut	Refractory Indices for Organic Industrial Wastes (803231)	1 year	18,000
International Ozone Institute	State-of-the-Art Study on Ozone for Water & Wastewater Treatment (803357)	1 year	8,000
<u>Maine</u>			
Research Institute of the Gulf of Maine	Develop Biomedical Procedures Establishing Water Quality Criteria of Marine Fish (800831)	1 year	60,100
State of Maine	Feasibility of Identifying Mystery Oil Spills (801006)	15 months	89,820
<u>Massachusetts</u>			
Harvard University	Biological Control of Microbial Pollutants in Natural Waters (800433)	1 year	30,000
Massachusetts Institute of Technology	Mechanism of NO, CO, & HC Formation in Combustion (800729)	1 year	59,440

GRANTS

<u>GRANTEE</u>	<u>TITLE</u>	<u>GRANT PERIOD</u>	<u>AMOUNT</u>
<u>Massachusetts</u>			
Massachusetts Institute of Technology	Catalytic Desulfurization & Denitrogenation (800897)	1 year	\$ 37,310
Harvard University	Physiological Response to Atmospheric Pollutants (802030)	1 year	61,463
Woods Hole Oceanographic Institution	Cape Cod Wastewater Renovation & Retrieval System (802037)	2 years	231,400
Harvard University	Identification & Mathematical Modeling of Basic Transport Mechanisms in Eutrophic Systems (802631)	1 year	14,807
New England Medical Center Hospital	Relationship of Blood Lead Levels to Lead in Household Drinking Water (802794)	15 months	3,250
Worcester Polytechnic Institute	Catalytic Conversion of Hazardous & Toxic Chemicals (802857)	1 year	20,182
Harvard University	Research on Relationships Between Land Use, Transportation & Urban Air Quality (802988)	2 years	100,640
University of Massachusetts	Short Course on Application of Stormwater Management Models (803069)	1 year	29,900
University of Massachusetts	Fluorescent Antibody Methods for Determination of Fecal Streptococci Source (803146)	1 year	40,000
Massachusetts Institute of Technology	Combustion Research on Coal Nitrogen and Particulate Organic Matter (803242)	1 year	75,173
Boston College	Nationwide Evaluation of EPA Water Quality Citizen Participation Workshops (803464)	11 months	66,074

GRANTS

<u>GRANTEE</u>	<u>TITLE</u>	<u>GRANT PERIOD</u>	<u>AMOUNT</u>
Harvard University	High Efficiency-High Velocity Aerosol Filtration (801399)	1 year	\$ 26,465
<u>Rhode Island</u>			
University of Rhode Island	Effect of Thermal Pollution on Pelagic Larvae of Crustacea (800981)	1 year	42,759
University of Rhode Island	Mammalian Cell Culture Assays of Toxic Substances (801379)	1 year	26,987
University of Rhode Island	Effects of Halogenated Aromatic Hydrocarbons on Metabolism of Foreign Organic Compounds (803112)	1 year	24,466
University of Rhode Island	Ocean Dumping--Stability & Resiliency Experimental Ecosystems Exposed Constant & Time Varying Stresses (803143)	1 year	58,924
University of Rhode Island	Dredge Spoils & Sediment Pollution on Trace Metal Assimilation by Organisms (803243)	1 year	60,296
University of Rhode Island	Role of Polyamines in Adaptation of Coliforms to the GI Tract (803255)	1 year	20,483
University of Rhode Island	Coprostanol Analysis in Ocean Bathing Beach Waters (803323)	1 year	8,000
University of Rhode Island	Petroleum Hydrocarbons in Dredge Spoils (803415)	1 year	15,663

<u>GRANTEE</u>	<u>GRANTS</u> <u>TITLES</u>	<u>GRANT PERIOD</u>	<u>AMOUNT</u>
<u>Vermont</u>			
Agency of Environmental Conservation	Solid Waste Demonstration & Resource Recovery System (001040)	1 year	\$ 50,000

CONTRACTS AWARDED
to REGION I

CONTRACTS

<u>CONTRACTOR</u>	<u>CONTRACT</u>	<u>PERIOD OF AWARD</u>	<u>AMOUNT</u>
<u>Connecticut</u>			
Combustion Engineering, Inc.	Staged Combustion Technology--Tangentially Coal Fired Boilers (68-02-1486)	1 1/2 years	\$ 143,000
Combustion Engineering, Inc.	Full Scale Field Testing Program to Study Methods for Reduction of NO _x (68-02-1367)	1 year	231,066
Industrial Gas Cleaning Institute	Air Pollution Control Technology and Costs for Selected Sources (68-02-1473)	2 years	227,710
J.M. Viladas Company	Public Opinion Survey of Fuel Crisis (68-01-2552)	1 year	12,000
The Research Corporation	Oil Spill in Casco Bay, Maine (68-01-1134)	2 months	11,084
Resource Engineering Associates	State-of-the-Art Study for Beverage Industry (68-01-0914)	1 year	25,141
State of Connecticut	Long Island Sound Regional Study (68-01-1852)	4 months	10,000
The Research Corporation of New England	Evaluation of Source Compliance Schedule (68-02-1421)	6 months	75,000
The Research Corporation of New England	Coordinate Trouble-shooting & Training Services HAPEMS/CDS Data Systems (68-02-1304)	3 months	2,350
The Research Corporation of New England	Hazardous Air Pollution Enforcement Management System (68-02-0295)	1 month	5,610
The Research Corporation of New England	Development of Sampling Procedures for Fugitive Emissions (68-02-1815)	1 year	85,000

CONTRACTS

<u>CONTRACTOR</u>	<u>CONTRACT</u>	<u>PERIOD OF AWARD</u>	<u>AMOUNT</u>
The Research Corporation of New England	Adaption & Evaluation of Odor Measuring Techniques to Various Studies (68-02-0662)	3 months	\$ 24,487
The Research Corporation of New England	Study of Indoor Air Quality (68-02-0745)	1 month	12,022
The Research Corporation of New England	Impact of Standards of Performance on 1985 Emissions--Phase II (68-02-1805)	3 months	45,000
The Research Corporation of New England	Guideline Document for Air Quality at Petroleum Sites (68-02-1489)	6 months	100,000
United Aircraft Corporation	Economic Study of Fuel Gas Environmental Impact (68-02-1099)	10 months	249,000
United Aircraft Corporation	Investigation of Aerodynamics Phenomenon Re: Pollution From Combustion Process (68-02-1092)	9 months	114,451
United Aircraft Corporation	Standards of Performance for Machinery and Mechanical Products Manufacturing (68-01-2914)	8 months	1,064,396
York Research Corporation	Field Sampling--Atmospheric Emissions (68-02-1401)	3 years	458,691
<u>Maine</u>			
State Department of Health	Pesticide Project (68-01-2680)	1 year	25,000
University of Maine	Radioactive Isotopic Characterization of Environment Near Wiscasset, Maine (68-01-2654)	1 year	14,000

CONTRACTS

<u>CONTRACTOR</u>	<u>CONTRACT</u>	<u>PERIOD OF AWARD</u>	<u>AMOUNT</u>
<u>Massachusetts</u>			
ABT Associates, Inc.	Environmental Impact of Highway Deicing (68-03-0442)	9 months	\$ 50,000
Arthur D. Little, Inc.	Analysis of Methodology for Economic Impact of Airport Noise (68-01-2432)	2 months	10,000
Arthur D. Little, Inc.	Pesticide Scientific and Economic Reviews (68-01-2489)	15 months	578,000
Arthur D. Little, Inc.	Economic Impact Analysis on Timber Products Industry (68-01-2303)	4 months	25,113
Arthur D. Little, Inc.	Economic Impact Analysis--Pulp, Paper & Paperboard Industry (68-01-2305)	4 months	10,000
Arthur D. Little, Inc.	Economic Impact Analysis on Converted Paper Products (68-01-2306)	4 months	10,000
Arthur D. Little, Inc.	Study of EPA Particulate Sampling Train (68-02-0632)	1 year	85,470
Arthur D. Little, Inc.	Economic Impact Analysis on Paint and Ink Industry (68-01-2308)	4 months	10,000
Arthur D. Little, Inc.	Economic Impact Analysis on Paving and Roofing Industry (68-01-2311)	4 months	10,000
Arthur D. Little, Inc.	Economic Impact Analysis on Inorganic Chemical Industry (68-01-2309)	5 months	18,000
Arthur D. Little, Inc.	Guidelines for Economic Study on Inorganic Chemicals Industry (68-01-2317)	11 months	12,500
Arthur D. Little, Inc.	Economic Impact Analysis on Printing Industry (68-01-2318)	4 months	10,000

CONTRACTS

<u>CONTRACTOR</u>	<u>CONTRACT</u>	<u>PERIOD OF AWARD</u>	<u>AMOUNT</u>
Arthur D. Little, Inc.	Effluent Guideline Economic Study--Organic Chemicals (68-01-2323)	7 months	\$ 92,350
Arthur D. Little, Inc.	Mineral Mining and Processing Industry (68-01-2325)	1 month	27,945
Arthur D. Little, Inc.	Coal Mining Industry (68-01-2326)	1 month	27,780
Arthur D. Little, Inc.	Final Report on Economic Analysis for Inorganic Chemical Industry (68-01-2330)	2 months	3,000
Arthur D. Little, Inc.	Industry Comments on Toxic Pollutant Standards (68-01-2336)	4 months	18,000
Arthur D. Little, Inc.	Economic and Technical Evaluation of Toxic Pollutant Standards (68-01-2344)	2 months	30,000
Arthur D. Little, Inc.	Review of Guidelines for Textiles Industry (68-01-2345)	1 year	15,000
Arthur D. Little, Inc.	Final Reports for Phase I Economic Impact Studies (68-01-2354)	3 months	16,316
Arthur D. Little, Inc.	Feasibility of Removing Metals from Sludges (68-01-2351)	3 months	22,190
Arthur D. Little, Inc.	Laboratory and Pilot Plant Study of Dual Alkali Process for SO2 Control (68-01-1071)	17 months	200,000
Arthur D. Little, Inc.	Systems Analyses of Radiation Programs (68-01-1128)	1 month	69,203
Arthur D. Little, Inc.	Investigating Economics of Certain Pesticide Disposal Methods (68-01-1140)	6 months	50,000

CONTRACTS

<u>CONTRACTOR</u>	<u>CONTRACT</u>	<u>PERIOD OF AWARD</u>	<u>AMOUNT</u>
Arthur D. Little, Inc.	Development of Processes used in Preparation of Oil Removal Plans (68-01-2901)	6 months	\$ 75,000
Arthur D. Little, Inc.	Investigation of Oil Discharges from Point Sources (68-01-2911)	11 months	150,000
Arthur D. Little, Inc.	Technical Assistance for the Office of Research and Development (68-01-2941)	1 year	75,000
Arthur D. Little, Inc.	Alternatives for Refinery SO _x Control (68-02-1332)	2 1/2 years	295,765
Arthur D. Little, Inc.	Economic Impact Analyses--Timber & Textile Industries (68-01-1457)	6 months	25,900
Arthur D. Little, Inc.	Economic Impact Analysis on Plastics Industry (68-01-1486)	4 months	10,000
Arthur D. Little, Inc.	Economic Impact Analysis on Rubber Industry (68-01-1491)	4 months	10,000
Arthur D. Little, Inc.	Economic Impact Analysis on Asbestos Industry (68-01-1492)	4 months	10,000
Arthur D. Little, Inc.	Economic Impact Analysis on Non-ferrous Metals Industry (68-01-1493)	4 months	10,000
Arthur D. Little, Inc.	Economic Impact Analysis on Glass Industry (68-01-1495)	6 months	10,000
Arthur D. Little, Inc.	Economic Analysis of Emission Studies (68-02-1349)	9 months	139,000

CONTRACTS

<u>CONTRACTOR</u>	<u>CONTRACT</u>	<u>PERIOD OF AWARD</u>	<u>AMOUNT</u>
Arthur D. Little, Inc.	Support During Preparation of Testimony on Hazardous Waste Materials Act of 1973 (68-01-2218)	4 months	\$ 20,000
Arthur D. Little, Inc.	Impact of Restrictions on Pesticide R&D (68-01-2219)	8 months	70,382
Arthur D. Little, Inc.	Analysis of Virgin and Secondary Papers Material Demands (68-01-2220)	1 year	200,000
Arthur D. Little, Inc.	Technical Documentation for Determining Harmful Quantities and Rates of Penalties (68-01-2241)	2 months	28,727
Arthur D. Little, Inc.	Assessment of Aircraft Emission Control Technology (68-03-2007)	1 1/2 years	80,000
Arthur D. Little, Inc.	Analysis of Impact of 72 Guidance Effluent Limits (68-01-2652)	2 months	9,080
Arthur D. Little, Inc.	Hazardous Waste Practices--Pharmaceuticals (68-01-2684)	6 months	100,000
Arthur D. Little, Inc.	Preliminary & Intensive Study of Selected Environ- mental Contaminants--Titanium (68-01-2688)	8 months	20,000
Arthur D. Little, Inc.	Current Awareness Network for Toxic Substances (68-01-2694)	2 years	150,000
Baird Atomic, Inc.	Aerial Surveillance for Oil Spills (68-01-2260)	3 months	14,615
Bionomics, Inc.	Toxicities of Chlordane, Etc., to Sheepshead Minnows (68-03-2069)	2 years	100,000

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Bolt, Beranek & Newman	Interstate Motor Carrier-Noise Abatement Regulation Program (68-01-2355)	6 months	\$ 20,000
Bolt, Beranek & Newman	Noise Abatement Services (68-01-2320)	6 months	75,000
Bolt, Beranek & Newman	Dallas/Ft. Worth Airport Noise Study (68-01-2628)	1 month	19,685
Bolt, Beranek & Newman	Technical Analyses & Measurement Studies for Development & Promulgation of Noise Labeling Regulations (68-01-2493)	1 year	74,000
Bolt, Beranek & Newman	Interstate Rail Carrier--Noise Abatement Regulation Program (68-01-2301)	3 years	40,000
Bolt, Beranek & Newman	Study of Alternative Approaches to Quiet Construction Sites (68-01-2338)	2 months	25,000
Bolt, Beranek & Newman	Work Related to Construction Equipment Regulatory Effort (68-01-2316)	8 months	85,000
Bolt, Beranek & Newman	Response of Population of U.S. to Acoustical Climate in Urban Residence (68-01-2275)	4 months	110,000
Charles River Associates	Economic Assessment of Availability of Coal Supplies (68-01-2328)	4 months	15,000
Charles River Associates	Ground Transportation Fuel Economics and Air Pollution (68-01-2481)	8 months	67,500
Charles River Associates	Study of Alternatives to Gas Rationing in Los Angeles (68-01-2235)	1 month	89,256

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Curran Associates, Inc.	Environmental Review of Guidelines for Water Impoundment Projects (68-01-2924)	6 months	\$ 35,000
Curran Associates, Inc.	Mathematical Model for Optimal Waste Load Allocations (68-01-2916)	1 year	100,000
Data Resources, Inc.	Economic Impact Analysis for Integrated Iron and Steel Industry (68-01-2459)	4 months	30,000
Development Sciences, Inc.	Energy Requirements for Pollution Control (68-01-2498)	4 months	50,000
Development Sciences, Inc.	Reducing the Intermedia Impact of Industrial Residuals (68-01-2295)	7 months	38,000
EG&G	Environmental Temperature & Dew Point Measuring System (68-02-1698)	2 months	4,895
Energy Resources Company, Inc.	Assessment of Accumulator System for Selected Classes of Chemical Substances (68-01-2925)	2 years	211,610
Energy Resources Company, Inc.	Development of Decision Rules for Variances to Thermal Power Plants (68-01-2477)	4 months	50,000
Energy Resources Company, Inc.	Qualitative Analysis of Environmental Implications of Project Independence (68-01-2491)	2 months	20,000
Environmental Research & Technology, Inc.	Adaption of Gaussian Plume Urban Dispersion Model (68-02-1753)	10 months	40,000
Environmental Research & Technology, Inc.	Site Selection for Ambient Air Monitoring (68-02-1826)	8 months	30,000

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Factory Mutual Research Corp.	Fail-Safe Devices Preventing Spills of Hazardous Materials (68-03-2054)	2 years	\$ 96,000
Factory Mutual Research Corp.	Documentation of Historical Data on Hazardous Materials Spills (68-03-0317)	1 year	38,000
GCA Corporation	Method for Point & Area Source Hydrogen Inventory (68-02-1440)	2 months	3,000
GCA Corporation	Development of Hydrocarbon Emission Inventory (68-02-1033)	6 months	3,402
GCA Corporation	Ambient CO Monitoring at Regional Shopping Center (68-02-1041)	3 months	32,500
GCA Corporation	Regional Air Quality Inventory (68-02-1042)	8 months	75,000
GCA Corporation	Preparation of a Transportation Control Guidance (68-02-1043)	3 months	14,500
GCA Corporation	Analyze Time-Concentration Relationship and Validate (68-02-1051)	6 months	50,000
GCA Corporation	Develop HATREMS (68-02-1052)	1 year	70,000
GCA Corporation	Transportation Control Strategy (68-02-1057)	7 months	55,000
GCA Corporation	Development of Fibrous Filter Performance Data (68-02-1075)	4 months	45,000
GCA Corporation	Development of Support Data for Indirect Guidelines Document (68-02-1063)	2 months	65,000

CONTRACTS

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GCA Corporation	Review and Evaluation of TCP's (68-02-1241)	3 days	\$ 3,190
GCA Corporation	Quick Reaction Engineering and Technical Services (68-02-1316)	2 1/2 years	117,368
GCA Corporation	Studies on Pollution Strategies and Consultation (68-02-1337)	14 months	153,384
GCA Corporation	Fine Particulate Measuring Device (68-02-1341)	7 months	75,000
GCA Corporation	Assist in Developing Transportation Control Strategies (Chicago) (68-02-1394)	4 months	58,000
GCA Corporation	Air Quality Maintenance Plan--Denver (68-02-1423)	4 months	70,250
GCA Corporation	Develop Transportation Control Plan--NY, NJ, CT (68-02-1429)	4 months	30,000
GCA Corporation	Develop Transportation Control Plan--MA (68-02-1434)	4 months	15,000
GCA Corporation	Fractional Efficiency of a Utility Boiler Baghouse (68-02-1438)	1 year	205,000
GCA Corporation	Baltimore Particulate Study (68-02-1455)	4 months	18,000
GCA Corporation	Evaluate Oregon & Washington TCP's (68-02-1463)	2 months	30,000
GCA Corporation	Air Quality & Monitoring Trends, & Guideline Report (68-02-1478)	1 year	75,000

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GCA Corporation	Evaluation of Novel Air Pollution Control Devices (68-02-1487)	13 months	\$ 60,000
GCA Corporation	Updating & Upgrading Point Source Inventories (68-01-1594)	9 months	32,171
GCA Corporation	Preparation of a Transportation Control Plan (68-02-1828)	4 months	10,000
Harbridge House, Inc.	Analysis of Economic Growth Impacts (68-01-1484)	4 months	56,500
Harbridge House, Inc.	Land Use Impact of Regulations to Review New Indirect Sources of Air Pollution (68-01-2349)	6 months	50,000
JBF Scientific Corporation	Performance Evaluation of Existing Lagoons (68-03-2062)	1 1/2 years	210,000
JBF Scientific Corporation	Identify Location of In-Place Pollutants in Ports, Harbors, etc. (68-01-2920)	8 months	75,000
Mason Research Institute	Develop In-vitro and In-vivo Mutagenesis Bioassays (68-01-2447)	14 months	250,000
Mason Research Institute	Subchronic Toxicities of HCB in Dogs (68-01-2936)	1 1/2 years	60,000
Mass Department of Health	Determine General Organic Content of Water (68-03-0267)	1 year	45,000
Massachusetts Institute of Technology	Incorporate Air Quality Requirements into Transportation Decision (68-01-2476)	5 months	105,000
Meta Systems, Inc.	Study of Land Use Environmental Quality Relationship in Quinnipiac River (68-01-2622)	14 months	90,000

CONTRACTS

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Meta Systems, Inc.	Evaluation of Alternative Methods for Financing Municipal Waste Treatment (68-01-2411)	4 months	\$ 50,000
Process Research, Inc.	Membrane Fouling Mechanisms in the Electrodialysis Process (68-01-0091)	1 year	2,508
Process Research, Inc.	Selective Nutrient Removal from Secondary Effluent (68-01-0179)	1 year	13,051
QEI, Inc.	Economic Welfare Impacts of Urban Noise (68-01-2634)	10 months	40,000
Raytheon Company	Study Prototype Laser-Doppler Velocimetry Instrumentation (68-02-1752)	2 months	20,000
Resource Planning Associates	Feasibility Study of Solid Waste Source Separation in Urban Areas (68-03-0391)	6 months	15,000
Resource Planning Associates	Recycling Subsidy Study on Secondary Industry (68-03-0195)	5 months	20,000
Resource Planning Associates	Secondary Materials in Federal Construction (68-01-2272)	9 months	75,000
Resource Planning Associates	Cost Effectiveness of Federal Regulatory Programs (68-01-2256)	1 year	75,000
Scientific Energy Systems, Inc.	Design & Develop Rankine Cycle Engine (68-04-0004)	1 1/2 years	2,172,700
Smithsonian Institution	Survey of National & International Environmental Monitoring & Surveillance Activity (68-01-2442)	5 months	9,576
Walden Research	Prototype Nitrate Detector (68-02-0591)	3 months	12,000

CONTRACTS

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State of Massachusetts	Southeastern New England Water Quality Study (68-01-1879)	10 months	\$ 10,000
Temple Barker & Sloane	Economic Impact of Water Effluent Guidelines on Electric Utility Industry (68-01-2418)	1 month	20,000
Temple Barker & Sloane	Economic Impact of Water Effluent Guidelines on Electric Utility Industry (68-01-1582)	1 month	8,000
Thermo Electron Corporation	Design & Develop Rankine Cycle Engine (68-01-0409)	6 months	412,000
Thermo Electron Corporation	Compounding the IC Engine for Autos (68-03-2129)	6 months	112,294
Thermo Electron Corporation	Solid Waste as Supplementary Fuel in Boilers (68-03-0355)	1 year	100,000
Urban Systems Research and Engineering	Reaction Losses From Water Pollution (68-01-2282)	1 year	124,000
Walden Research	Regional Air Quality Inventory (68-02-1039)	6 months	70,000
Walden Research	Technical Support--Mass AQMP (68-02-1466)	6 months	25,000
Walden Research	Modeling of Selected Power Plants (68-02-1065)	4 months	90,000
Walden Research	Modeling of Air Quality Impacts of Selected Power Plants (68-02-1484)	6 months	180,000
Walden Research	Evaluate Air Quality Impact of Energy Shortage (68-02-1830)	5 months	75,000

CONTRACTS

<u>CONTRACTOR</u>	<u>CONTRACT</u>	<u>PERIOD OF AWARD</u>	<u>AMOUNT</u>
<u>Rhode Island</u>			
Chemical Construction Corp.	Federal Clean Car Incentive Program (10-02-0114)	1 week	565,081
Raytheon Company	Math Model of the Housatonic River and Narragansett Bay (68-01-1890)	6 months	20,659
Raytheon Company	Automatic On-line Wastewater Sampling System (68-03-0250)	1 month	38,173
Raytheon Company	Baseline Surveys in New York Bight Area (68-01-2770)	1 year	541,000
State of Rhode Island	Southeastern New England Water Quality Study (68-01-1851)	10 months	10,000
<u>Vermont</u>			
Richard W. McLay	Insure the State Reliability of Streams Heat Assimilation (68-03-0439)	4 months	21,000

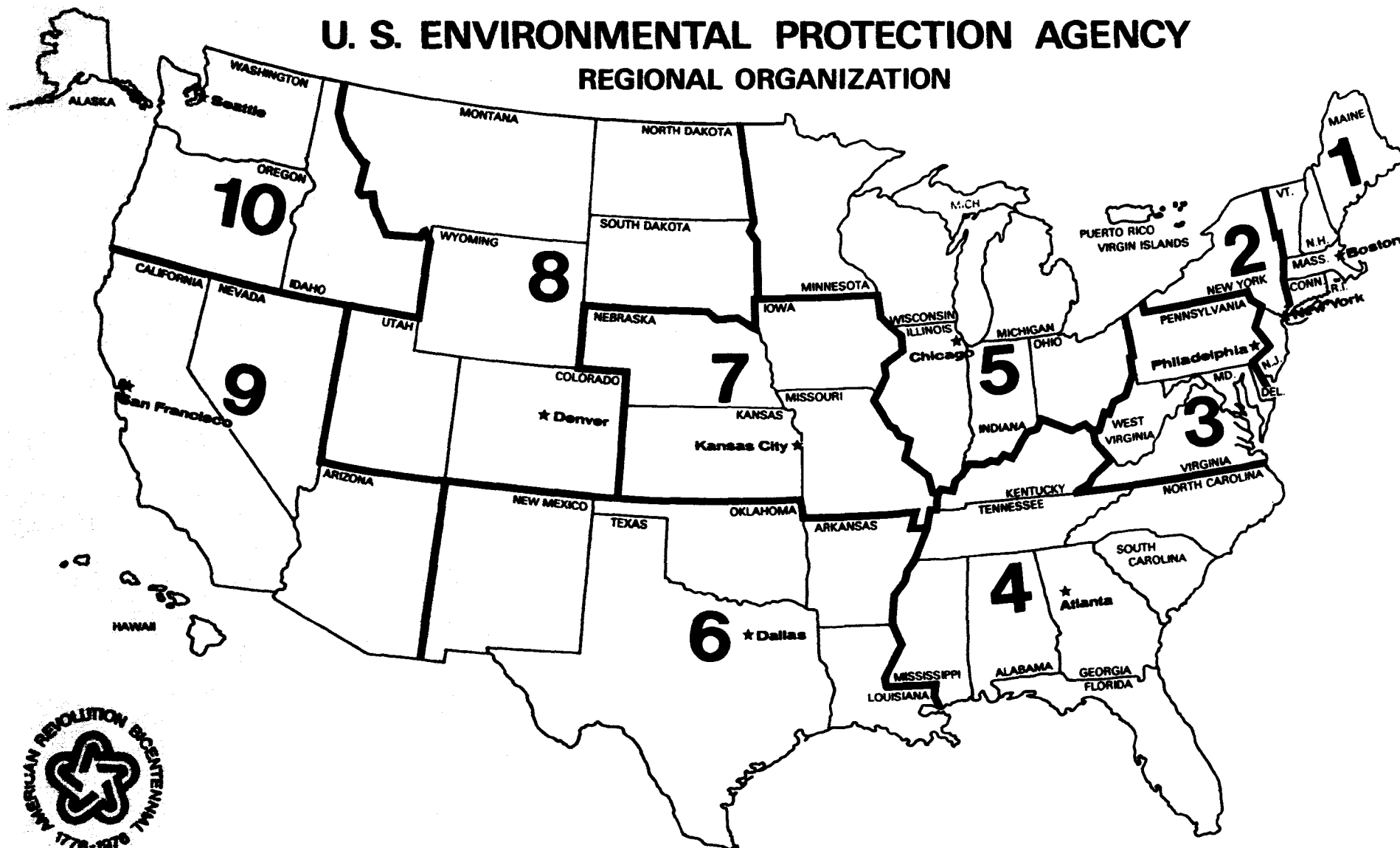
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