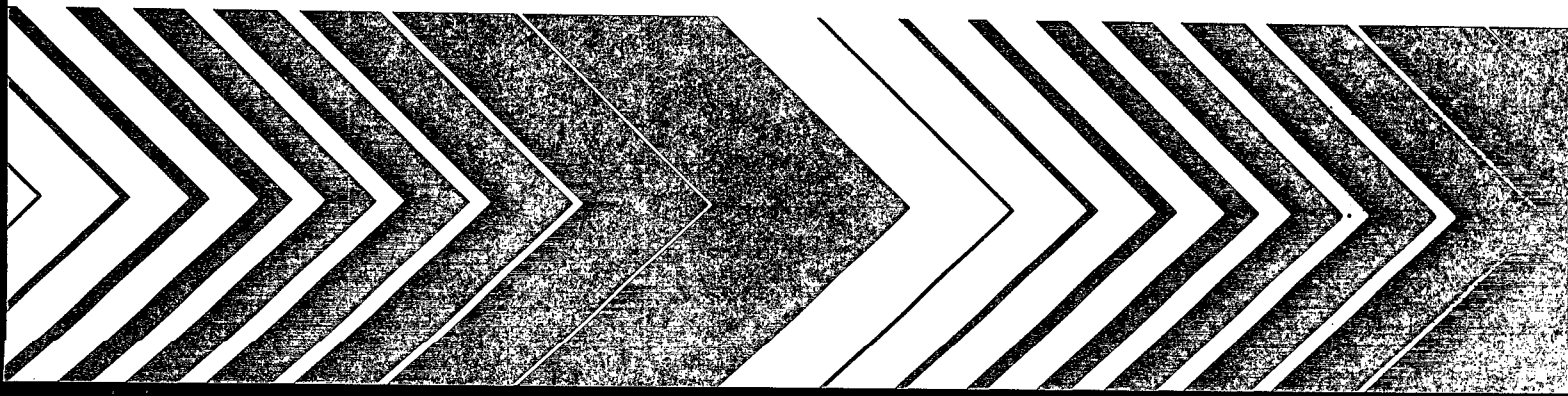
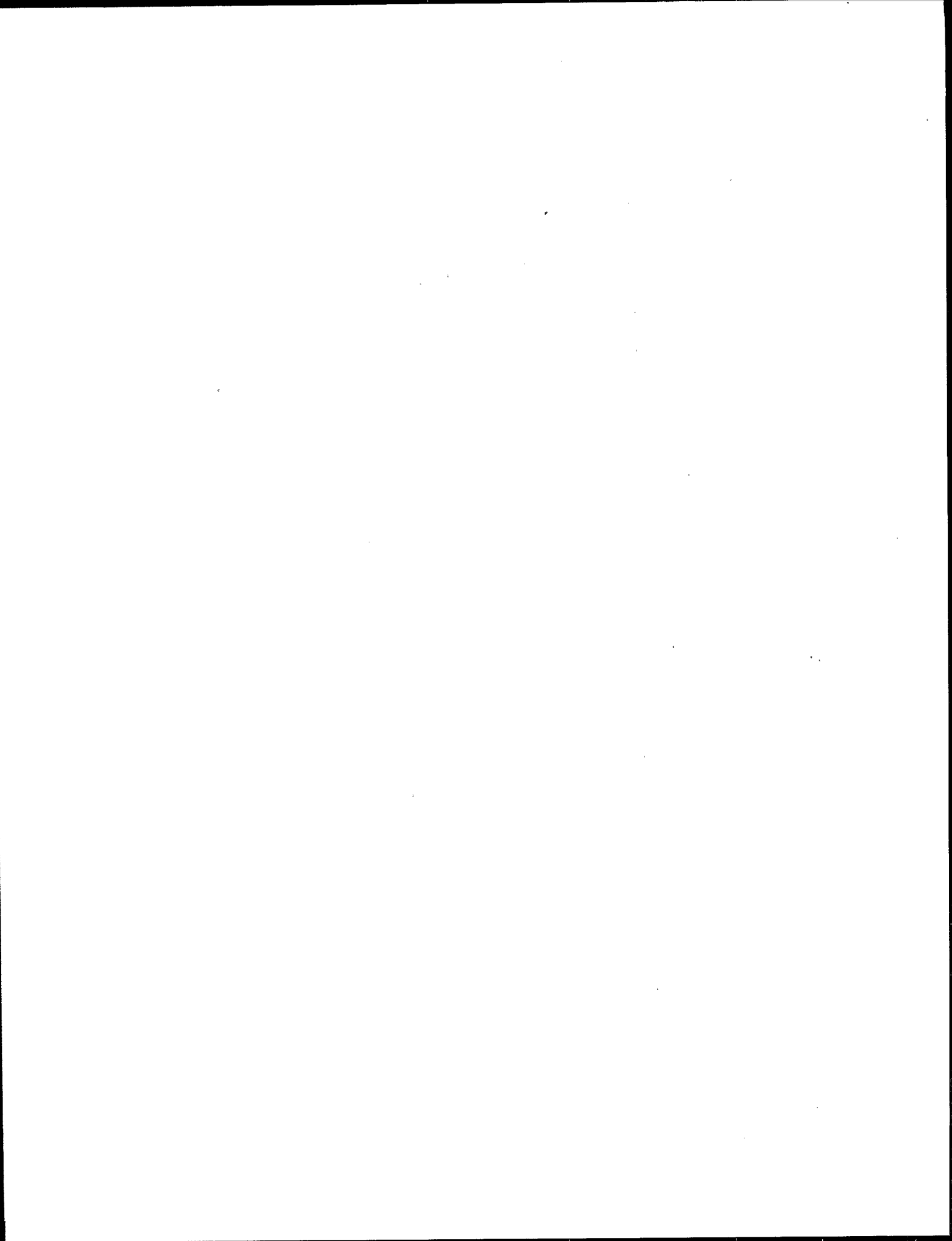




Indoor Air-Assessment

An Inventory of Indoor Air Quality Research in the United States: 1989-1990





EPA/600/8-90/080F

March 1991

**INDOOR AIR - ASSESSMENT
AN INVENTORY OF INDOOR AIR
QUALITY RESEARCH
IN THE UNITED STATES: 1989-1990**

**ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE
OFFICE OF HEALTH AND ENVIRONMENTAL ASSESSMENT
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
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PREFACE

In October 1986 Congress passed the Superfund Amendments and Reauthorization Act (SARA, PL 99-499) that includes Title IV—The Radon Gas and Indoor Air Quality Research Act. The Act directs that EPA undertake a comprehensive indoor air research program.

Research program requirements under Superfund Title IV are specific. They include identifying, characterizing, and monitoring (measuring) the sources and levels of indoor air pollution; developing instruments for indoor air quality data collection; and studying high risk building types. The statute also requires research directed at identifying effects of indoor air pollution on human health. In the area of mitigation and control the following are required: development of measures to prevent or abate indoor air pollution, demonstration of methods to reduce or eliminate indoor air pollution, development of methods to assess the potential for contamination of new construction from soil gas, and examination of design measures for preventing indoor air pollution. EPA's indoor air research program is designed to be responsive in every way to the legislation.

In responding to the requirements of Title IV of the Superfund Amendments, EPA's Office of Research and Development has organized the Indoor Air Research Program around the following categories of research: (A) Sources of Indoor Air Pollution, (B) Building Diagnosis and Measurement Methods, (C) Health Effects, (D) Exposure and Risk (Health Impact) Assessment, and (E) Building Systems and Indoor Air Quality Control Options.

EPA is directed to undertake this comprehensive research and development effort not only through in-house work but also in coordination with other Federal agencies, state and local governments, and private sector organizations having an interest in indoor air pollution.

The ultimate goal of SARA Title IV is the dissemination of information to the public. This activity includes the publication of scientific and technical reports in the areas described above. To support these research activities and other interests as well, EPA publishes its results in the INDOOR AIR report series. This series consists of five subject categories: Sources, Measurement, Health, Assessment, and Control. Each report is printed in a limited quantity. Copies may be ordered while supplies last from:

U.S. Environmental Protection Agency
Center for Environmental Research Information
26 West Martin Luther King Drive
Cincinnati, OH 45268

When EPA supplies are depleted, copies may be ordered from:

National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161

ABSTRACT

A survey of indoor air quality (IAQ) research projects in the United States was undertaken using a standard form and keyword list. In response to the request for participation, 134 completed forms were received from 97 principal investigators at 32 institutions. Universities had the largest number of IAQ research projects (23), followed by EPA (20), other Federal agencies (19), states (18), national laboratories (15), and private research organizations (13). The results of this inventory will provide EPA and NATO's Committee on the Challenges of Modern Society with information on the current directions and funding levels of IAQ research in the United States. Although this information is preliminary, it can be useful to EPA in planning future research.

TABLE OF CONTENTS

	<u>Page</u>
DISCLAIMER	ii
PREFACE	iii
ABSTRACT	v
LIST OF TABLES	vii
LIST OF FIGURES	vii
AUTHORS, CONTRIBUTORS, AND REVIEWERS	viii
EXECUTIVE SUMMARY	1
INTRODUCTION	3
METHODOLOGY	4
FINDINGS	6
INSTITUTIONS CONDUCTING IAQ RESEARCH	6
IAQ RESEARCH FUNDING FOR 1989-1990	9
DESCRIPTIONS OF IAQ RESEARCH PROJECTS	9
SUMMARY	21
REFERENCES	22
APPENDIX A. KEYWORD LIST	A-1
APPENDIX B. 1990 INDOOR AIR QUALITY RESEARCH PROJECTS	B-1
APPENDIX C. COST 613 FORMS RECEIVED FOR 1990 IAQ RESEARCH PROJECTS	C-1

LIST OF TABLES

<u>Number</u>		<u>Page</u>
1	Institutions Responding to IAQ Research Inventory, by Institutional Category	7
2	Number of Projects by Institutional Category and Keyword Category	12
3	Number of Projects by Institutional Category and Keywords Related to General IAQ Project Objectives	13
4	Number of Projects by Institutional Category and Keywords Related to Climate/Ventilation	14
5	Number of Projects by Institutional Category and Keywords Related to Effect and Occupant	15
6	Number of Projects by Institutional Category and Keywords Related to Indoor Environment	17
7	Number of Projects by Institutional Category and Keywords Related to Methods	18
8	Number of Projects by Institutional Category and Keywords Related to Pollutants	19
9	Number of Projects by Institutional Category and Keywords Related to Sources	20

LIST OF FIGURES

1	Form of the Cost 613 Inventory of indoor air research	5
2	Number of projects, reported for each institutional category	8
3	Funding distribution for indoor air research projects, by institutional category	10

AUTHORS, CONTRIBUTORS, AND REVIEWERS

This report was written by Dr. Terrence Pierson and Ms. Dana Greenwood, Research Triangle Institute. The Indoor Air Quality Research Inventory was conducted under the technical direction of Dr. Michael Berry (EPA/ECAO). Others providing technical input and review include Norman Childs (EPA/ECAO), Dr. Kevin Teichman (EPA/Office of Research and Development), and Dr. Berndt Seifert (Institute for Water, Soil, and Air Hygiene, Federal Republic of Germany). Reviewers were Drs. Hugh McKinnon, Michael Dourson, and Anne Sergeant, Office of Health and Environmental Assessment.

EXECUTIVE SUMMARY

The North Atlantic Treaty Organization's Committee for Challenges of Modern Society (NATO-CCMS) initiated a Pilot Indoor Air Quality Study in 1988. In conjunction with the CCMS Pilot Study an inventory of ongoing research projects in indoor air quality was conducted by the Commission of European Countries (CEC). This program, Cost 613 Indoor Air Quality and its Impact on Man, developed the COST 613 form and a keyword list to inventory ongoing indoor air quality research projects in all CEC countries. To conduct a similar inventory in the United States, a package of materials was assembled which included the COST 613 form and the keyword list developed for the CEC inventory, a letter requesting voluntary participation in the inventory, and a set of completed COST 613 forms as examples. The packages of materials were mailed in late January and early February of 1990 to 160 individuals who were identified as likely to be conducting or sponsoring research in the field of indoor air quality. In response to the request for participation, 134 completed Cost 613 forms were received from 97 principal investigators located at 32 institutions. It is likely that some indoor air quality research projects may not have been captured by this voluntary request, especially those being conducted by Federal agencies other than EPA, universities, and private research organizations. In addition, some of the EPA program offices which are also conducting indoor air quality projects may not have been captured by this inventory. Of particular note is the absence of radon and asbestos projects that are being conducted through EPA program offices and not as part of the Agency's indoor air research program.

Universities show the largest number of indoor air quality research projects (23) followed by EPA (20), other Federal agencies (18), states (18), national laboratories (15), and private research organizations (12). Although some of the projects being conducted at universities are likely to be funded, at least in part, by one or more of the other institutional categories, no projects were reported by both the funding source institution and a university. Among Federal agencies other than EPA, the National Institute for Occupational Safety and Health and the Department of Energy account for most of the reported projects.

The results of this inventory provide the EPA and the NATO-CCMS with current information on the directions of indoor air quality research in the United States, the funding

levels of the projects, and the institutions conducting this research. Although this information is very preliminary, it can be useful to EPA in planning a future research program as required by the 1989 EPA Report to Congress on Indoor Air Quality. The CCMS Indoor Air Quality Pilot Study can also benefit from this information by identifying research areas being addressed and specific researchers conducting work in a specific area. The inventory also provides information on research topics that are not being adequately addressed. EPA may consider combining these preliminary results with other indoor air quality research summaries evolving from other sources, thereby increasing the scope of the survey.

INTRODUCTION

The North Atlantic Treaty Organization's Committee for Challenges of Modern Society (NATO-CCMS) initiated a Pilot Indoor Air Quality Study in 1988. The Pilot Study drew support from all member countries and 14 actively participated. Italy and the United States were designated as lead countries for this study. The general program of the Pilot Study approved by the CCMS mainly focuses on collection and presentation of the state-of-the-art methods and strategies for prevention and mitigation of indoor air pollution (Maroni, 1989a). The CCMS has attempted to gain an awareness of programs related to indoor air quality in other national and international agencies and organizations. One such program is an inventory of ongoing research projects in indoor air quality conducted by the Commission of European Countries (CEC). This program, Cost 613 Indoor Air Quality and its Impact on Man, developed and used the COST 613 forms to inventory ongoing indoor air research projects in CEC countries. These same forms were circulated to all national delegates of the CCMS for distribution to institutions and scientists within their respective countries (Maroni, 1989b).

This report presents the results of an inventory of indoor air quality (IAQ) research currently being conducted in the United States. This inventory was initiated by Dr. Michael Berry of the U.S. Environmental Protection Agency's Environmental Criteria and Assessment Office. The inventory follows the same methodology as that used by CEC and thus provides information that can be compared directly with the CEC inventory.

METHODOLOGY

To conduct the inventory, a package of materials was assembled which included the COST 613 forms (Maroni, 1989b) and the keyword list (Seifert, 1989) developed for the CEC inventory, a letter requesting voluntary participation in the inventory, and a set of completed COST 613 forms as examples. The COST 613 form is shown in Figure 1 and the keyword list developed for the CEC inventory is shown in Appendix A.

The packages of materials were mailed in late January and early February of 1990 to 160 individuals who were identified as likely to be conducting or sponsoring research in the field of indoor air quality. The mailing list included representatives from various U.S. EPA research offices, the indoor air quality coordinator in each of the other Federal agencies conducting indoor air quality research, at least one representative from each state or territorial government identified from the *Directory of State Indoor Air Contacts* (U.S. Environmental Protection Agency, 1988) as individuals responsible for research or regulatory programs, and other individuals identified from recent literature and conference proceedings on indoor air quality and from the listing of representatives on indoor air quality committees (Air & Waste Management Association, 1989). The latter list was successful in identifying representatives from research programs at national laboratories, private research organizations, and university-based research programs.

In response to the request for participation, 134 completed Cost 613 forms were received from 97 principal investigators located at 32 institutions. Additional forms were received for projects completed prior to 1989-1990, but these projects have not been included in this report. A number of recipients of the inventory materials responded that no projects were being conducted or sponsored under their supervision. The overall response rate for this voluntary inventory was approximately 50 percent. The largest number of nonrespondents was from state agencies. It is likely that most of the state agencies conducting indoor air quality research responded to this inventory request.

Institute, address		a
		b
Name of principal investigator	Telephone No.	
Descriptive project title		
Keywords (see attached list)		
Project start	(Envisaged) project end	
Estimated manpower	Estimated cost	

Figure 1. Form of the Cost 613 Inventory of indoor air research. "Indoor Air Quality and Its Impact on Man" (Cost 613) project inventory

FINDINGS

INSTITUTIONS CONDUCTING IAQ RESEARCH

Respondents to the inventory have been grouped into the following six institutional categories:

- U.S. Environmental Protection Agency (EPA/E)
- Other U.S. Federal Agencies (Federal/F)
- National Laboratories (Nat'l. Labs/N)
- Private Research Organizations (Private/P)
- Universities (U)
- States (S)

Table 1 provides a listing of each of the institutions, Federal agencies, and EPA offices who responded to this inventory grouped by institutional categories. A number of EPA research offices are shown in Table 1; however, some of the EPA program offices which may also be conducting indoor air quality projects have not been captured by this inventory. Of particular note is the absence of radon and asbestos projects that are being conducted through EPA program offices and not as part of the Agency's indoor air research program. A list of respondents, the titles of their projects, the annual funding level, and the anticipated completion date organized according to the institutional categories is provided in Appendix B. The number of projects reported for each of the institutional categories is shown in Figure 2. Universities show the largest number of projects (23) followed by EPA (20), other Federal agencies (18), states (18), national laboratories (15), and private research organizations (12). Although some of the projects being conducted at universities are likely to be funded, at least in part, by one or more of the other institutional categories, no projects were reported by both the funding source institution and a university. Among Federal agencies other than EPA, the National Institute for Occupational Safety and Health and the Department of Energy account for most of the reported projects, seven and six respectively. Among states, the largest number of projects was reported by California (11). Most of the other states reported only one or several ongoing projects. Among national laboratories, the largest number of projects was reported by the Lawrence Berkeley Laboratory (13). The Gas

TABLE 1. INSTITUTIONS RESPONDING TO IAQ RESEARCH INVENTORY, BY INSTITUTIONAL CATEGORY

Institutional Category	Responding Institutions
U.S. Environmental Protection Agency	Air and Energy Engineering Research Laboratory, Atmospheric Research and Exposure Assessment Laboratory Environmental Criteria and Assessment Office Health Effects Research Laboratory
Other Federal Agencies	National Aeronautics and Space Administration, National Institute for Occupational Safety and Health, National Institute of Standards and Technology, U.S. Department of Energy, U.S. Department of Housing and Urban Development, U.S. Department of Transportation
National Laboratories	Argonne National Laboratory, Lawrence Berkeley Laboratory, Lawrence Livermore National Laboratory
Private Research Institutions	Center for Indoor Air Research Dames and Moore; Gas Research Institute; Los Amigos Research and Education Institute, Inc.; Rand Corporation
Universities	Brigham Young University, Harvard School of Public Health, Rutgers University, University of Arizona College of Medicine, University of Illinois at Chicago, University of New Mexico School of Medicine—Cancer Center, University of Pittsburgh, Yale University School of Medicine
States	California Department of Health Services, Maryland Department of the Environment, Minnesota Department of Health, Texas Department of Health, Wisconsin Department of Health and Social Services

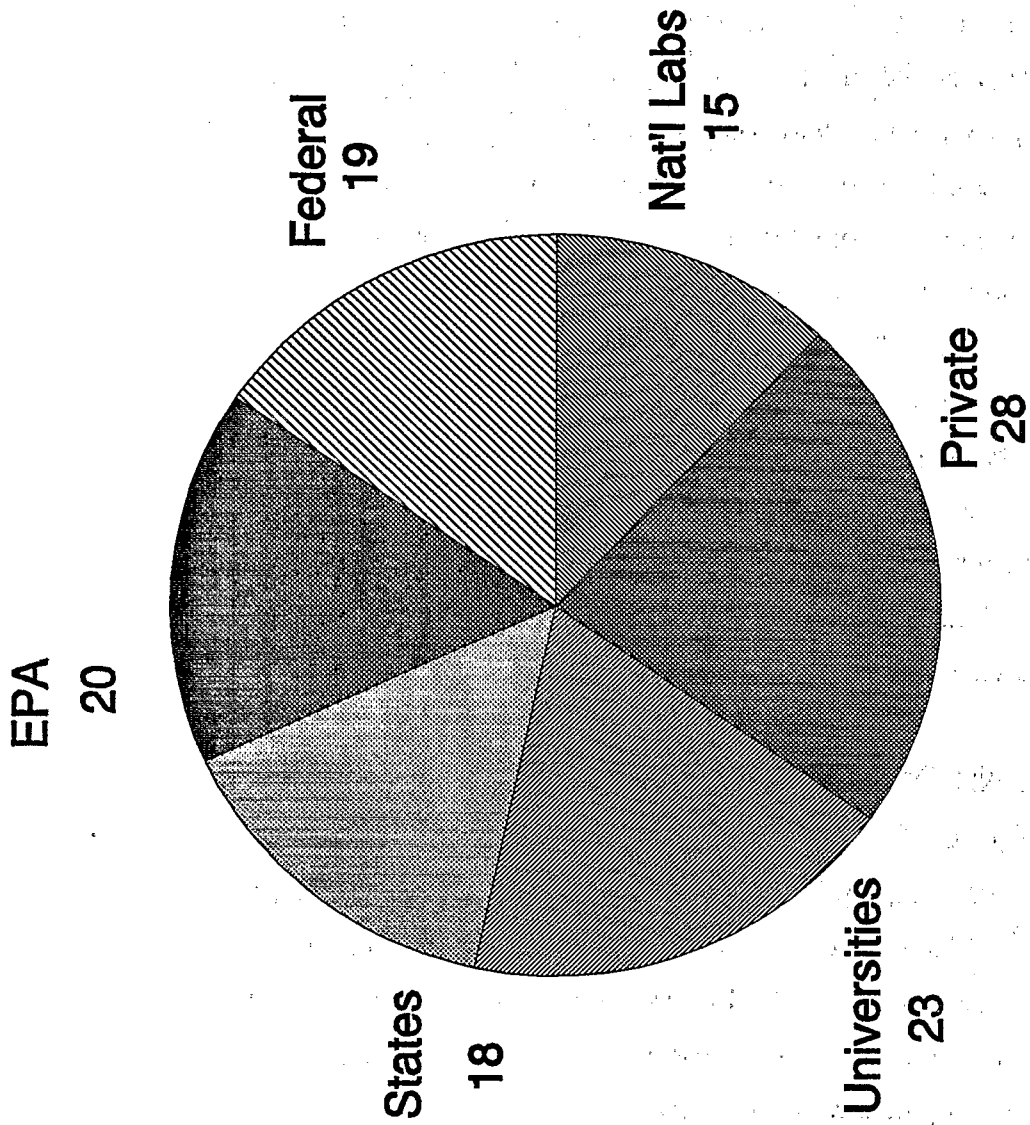


Figure 2. Number of projects, reported for each institutional category.

Research Institute reported eight projects, the largest number among private research organizations.

IAQ RESEARCH FUNDING FOR 1989-1990

The level of funding for the projects was reported in a variety of ways. Most individuals reported annual funding levels. However, several others reported funding on the basis of a fixed period, which was converted to an annual funding figure; and some individuals reported a fixed amount of funding for an ongoing research project with no date of termination. Funding reported in this latter manner was considered, for the purpose of this report, as funding received to-date for the project; and the same rate of annual funding was projected to continue for 1990. The distribution of total annual funding for indoor air quality research among the institutional categories is shown in Figure 3. It must be realized that much of the funding reported by EPA is distributed to extramural projects, and much of the research is actually conducted at universities and private research institutions. This is true of other Federal agencies as well. However, in this inventory no project was reported by more than one institution. For example, EPA-sponsored research was reported by EPA, not by a university conducting the research.

DESCRIPTIONS OF IAQ RESEARCH PROJECTS

An extensive list of keywords was distributed with the Cost 613 forms for the investigators to choose appropriate descriptors for their projects (see Appendix A, Keyword List). The keyword list was developed by CCMS and was used in the CEC inventory. The same list was also used in this study for consistency with the CEC inventory and NATO pilot study. The keywords on the list were distributed among seven general categories of related keywords. These categories were as follows:

- General IAQ Project Objectives
- Sources
- Climate/Ventilation
- Methods
- Indoor Environment
- Effect and Occupant
- Pollutants

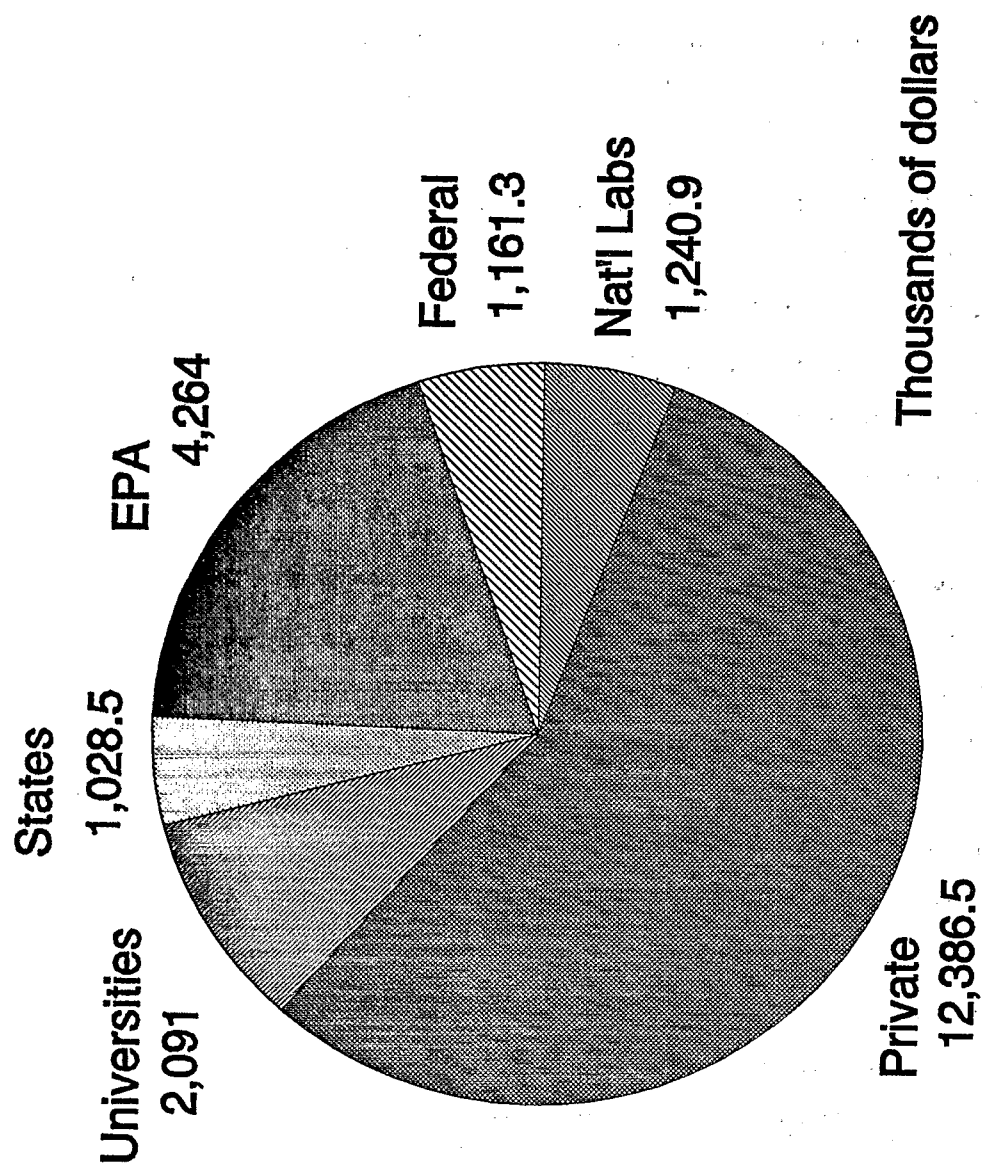


Figure 3. Funding distribution for indoor air research projects, by institutional category.

Some responses included key words not listed on the official keyword list. For the purpose of consistency with the CEC inventory, these terms were replaced by similar or inclusive words which do appear on the official keyword list. The actual reported terms for each project can be found on the returned COST 613 forms included in Appendix C to this report.

Tables 2 through 9 present summaries of the keywords used for projects reported within institutional category. Table 2 shows the number of projects within each institutional category using keywords associated with each of the keyword categories. The subsequent seven tables provide a more detailed summary of the number of projects using specific keywords within a keyword category, also shown by institutional category. The keyword categories with the largest number of reported projects were Methods (90), General IAQ Project Objectives (80), and Pollutants (79). For all three of these categories EPA and universities have the largest number of projects. The general keyword category with the fewest number of reported projects was Climate/Ventilation. Universities (14) and Other Federal Agencies (9) reported the most projects in this category.

The keyword category of General IAQ Project Objective covers a wide variety of specific keywords as shown in Table 3. The keywords associated with the largest number of projects in this category were exposure (34), concentrations (22), emissions (20), and control techniques (18). Exposure was associated most frequently with projects being conducted by universities (9), EPA (7), and national labs (7). Concentrations was associated most frequently with projects being conducted by universities (6), EPA (6), and national labs (6). Emissions was associated most frequently with projects being conducted by universities (10) and EPA (5). Control techniques was associated most frequently with projects being conducted by EPA (6) and other Federal agencies (5).

The keyword category of Climate/Ventilation had the fewest number of associated projects. Table 4 shows the specific keywords in this category and the number of projects associated with each keyword, reported by institutional category. Ventilation was the single keyword associated with the largest number of projects (29). It was associated most frequently with projects being conducted by Other Federal Agencies, such as NIOSH.

The keyword category of Effect and Occupant includes a large number of specific keywords as shown in Table 5. Health and risk are the two keywords in this category most

**TABLE 2. NUMBER OF PROJECTS BY INSTITUTIONAL CATEGORY
AND KEYWORD CATEGORY**

Keyword Category	Institutional Category ¹						TOTAL
	E	F	N	P	S	U	
General IAQ Project Objectives	17	12	14	7	11	19	80
Sources	13	5	6	5	9	14	52
Climate/Ventilation	8	9	6	1	7	14	45
Methods	20	10	14	11	16	19	90
Indoor Environment	5	12	8	2	15	17	59
Effect and Occupant	11	7	6	4	10	11	49
Pollutants	18	9	12	6	15	19	79

¹Legend to Institutional Category:

E = Environmental Protection Agency

F = other Federal agencies

N = national laboratories

P = private research

S = states

U = universities

**TABLE 3. NUMBER OF PROJECTS BY INSTITUTIONAL CATEGORY
AND KEYWORDS RELATED TO GENERAL IAQ PROJECT OBJECTIVES**

Keyword Category	Institutional Category ¹						TOTAL
	E	F	N	P	S	U	
Adsorption	2					1	3
Annual Exposure			1		1		2
Concentrations	6	1	6		3	6	22
Control		1	1	1			3
Control Strategy					2		2
Control Techniques	6	5	3		1	3	18
Cost/Benefit						1	1
Dose	1	1	1			3	6
Electrostatic Filters	2						2
Emissions	5		2	1	2	10	20
Energy Conservation			3			1	4
Exposure	7	3	7	4	4	9	34
Guidelines		1	1		1	1	4
Indoor/Outdoor Ratios			1			4	5
Reactions		1	2			1	4
Reactive				1			1
Seasonal Variations			6	1		2	9
Spatial Variations		2	1			3	6
Standardization					1		1
Standards	1	2	1		1	1	6
Strategies	3		1	2	1		7
Surfaces				1		2	3
TLV		1				1	2
Validation					1		1
Variations			2	2		3	7

¹Legend to Institutional Category:

E = Environmental Protection Agency

F = other Federal agencies

N = national laboratories

P = private research

S = states

U = universities

**TABLE 4. NUMBER OF PROJECTS BY INSTITUTIONAL CATEGORY
AND KEYWORDS RELATED TO CLIMATE/VENTILATION**

Keyword Category	Institutional Category ¹						TOTAL
	E	F	N	P	S	U	
ACS	4	3		1	1		9
Air Infiltration	1	2	3	1		1	8
Air Movement	3	1	2		1	4	11
Climate		1	1				2
Forced Ventilation		2	1		1	5	9
Humidity	2	1	2	1	1	1	8
Measurement						2	2
Meteorological Factors			1			3	4
Moisture	1			1		1	3
Multizonal	1						1
Natural Ventilation		1	1				2
Temperature	2	1	2	1	1	3	10
Ventilation	5	9	5		5	5	29

¹Legend to Institutional Category:

- E = Environmental Protection Agency
- F = other Federal agencies
- N = national laboratories
- P = private research
- S = states
- U = universities

**TABLE 5. NUMBER OF PROJECTS BY INSTITUTIONAL CATEGORY
AND KEYWORDS RELATED TO EFFECT AND OCCUPANT**

Keyword Category	Institutional Category ¹						TOTAL
	E	F	N	P	S	U	
Airway						2	2
Allergy					1	1	2
Asthma				1	1	2	4
Asthmatic	1					1	2
Atopic						2	2
Behavioral Effects	2	1					3
Cancer	2	1	3		1	1	8
Carcinogenic	3						3
Children	1				1	3	5
Comfort	3	2			1	1	7
Complaint Study						1	1
Complaints	1				1	1	3
Effects	2			1			3
Employees	2	2				2	6
General Population	1		1		2	2	6
Health	7	4		2	1		14
Hobby Activities					1		1
Hyperreactivity						1	1
Hypersensitivity					1	2	3
Immunotoxicity	1						1
Infection					2	2	4
Inhalation					1	1	2
Irritation	5	1			1	1	8
Lung Function				2		3	5
Mutagenicity	2	1					3
Nasal Function	1						1
Occupants	2	2			1	2	7
Physiological Reactions						1	1
Respiratory	5			1	1	6	13
Risk	5	1	3	2	2	1	14
Risk Groups				2			2
SBS	2	2	1		2	3	10
Sensory Effects	3						3
Susceptible Groups	1					2	3
Toxicology	1						1

¹Legend to Institutional Category:

E = Environmental Protection Agency
F = other Federal agencies
N = national laboratories
P = private research
S = states
U = universities

frequently associated with projects, and EPA is the institution conducting the largest number of these projects. Within this category, only one project is associated with each of the following keywords: toxicology, physiological reactions, nasal function, immunotoxicity, hyperactivity, and complaint studies. Projects associated with specific keywords relating to an exposed group include the following: asthmatic (2), children (5), employees (6), general population (6), occupants (7), risk groups (2), and susceptible groups (3). Ten projects were associated with the keyword SBS (sick-building syndrome).

The keyword category of Indoor Environment addresses different indoor settings where indoor air quality might be a concern. Table 6 presents the specific keywords in this category and the number of projects associated with each keyword, by institutional category. The three most frequently reported keywords in this category were residences (25), buildings (16), and offices (15). The indoor environments with the fewest associated projects were day-care centers (1), hospitals (1), mobile homes (1), and sports establishments (1). Universities, States, and Other Federal Agencies have the most projects associated with keywords in this category.

The keyword category of Methods includes keywords related to methods of measuring pollutants, methods of measuring effects, and analytic methodologies such as modeling. Table 7 presents the specific keywords in this category and the number of projects associated with each keyword, by institutional category. The three most frequently reported keywords in this category were models (24), analysis (20), and environmental monitoring (20). The EPA and universities have the most projects associated with keywords in this category.

The specific keywords included in the keyword category of Pollutants are shown in Table 8 along with the number of projects associated with each keyword, by institutional category. The three most frequently reported pollutants were VOCs (33), particulate matter (21) and nitrogen oxides (19). The institutional category with the most projects associated with VOCs and particulate matter was EPA; whereas, universities and private research organizations (i.e., Gas Research Institute) have the most projects addressing nitrogen oxides. Other pollutants associated with a relatively large number of projects include biologicals (14), ETS (13), formaldehyde (12), and radon (17). The national laboratories have the largest number of radon-related projects; EPA and the states have the largest number of

**TABLE 6. NUMBER OF PROJECTS BY INSTITUTIONAL CATEGORY
AND KEYWORDS RELATED TO INDOOR ENVIRONMENT**

Keyword Category	Institutional Category ¹						TOTAL
	E	F	N	P	S	U	
Buildings	4	4	5		1	2	16
Day-care Centers	1						1
Dwellings				1		3	4
Hospitals					1		1
Industrial Buildings						7	7
Mobile Homes						1	1
New Buildings		3	1		1	1	6
Offices	1	7	1		4	2	15
Residences	1	4	4	1	9	6	25
Schools		1	1		3		5
Sports Establishments						1	1
Traffic Related					1	2	3

¹Legend to Institutional Category:

E = Environmental Protection Agency

F = other Federal agencies

N = national laboratories

P = private research

S = states

U = universities

**TABLE 7. NUMBER OF PROJECTS BY INSTITUTIONAL CATEGORY
AND KEYWORDS RELATED TO METHODS**

Keyword Category	Institutional Category ¹						TOTAL
	E	F	N	P	S	U	
Analysis	5	2	3	5	3	2	20
Animal Study	2						2
Assessment		1	3	6	2		12
Bioassay	2		1			1	4
Biological Monitoring	1		1		1	1	4
Chamber Study	5				3	3	11
Controlled Exposure				1		2	3
Data Base	3	2	1			2	8
Detection		1					1
Detection Method		2	3		2	4	11
Development			4		1		5
Environmental Monitoring	7	2	2	2	2	5	20
Epidemiological Study		1			2	2	5
Epidemiological				1	1	2	4
Evaluation	6		1	5		1	13
Field Measurements	1	2	5	3	2	5	18
Field Studies					1		1
Field Trials	6				1	1	8
In Vitro Study	2						2
Interlab. Comparison			1	1		1	3
Investigations		1			1		2
Measurement		1	1	1	1	2	6
Measurement Methods		4	3	1	2	7	17
Measurements					1		1
Methods	8	1					9
Modeled Approach			4	1	1	2	8
Models	5	2	6	1	2	8	24
Multizonal	1	1	2	1			5
Passive Samplers	1	1	2	1	4	4	13
Representative Survey	2	1			2		5
Review	1	1	1	2			5
Sampling	2	3		1	3	7	16
Standardization	2					1	3
Subjective Evaluation	1					1	2
Validation	5	1	3	1		4	14

¹Legend to Institutional Category:

E = Environmental Protection Agency

F = other Federal agencies

N = national laboratories

P = private research

S = states

U = universities

**TABLE 8. NUMBER OF PROJECTS BY INSTITUTIONAL CATEGORY
AND KEYWORDS RELATED TO POLLUTANTS**

Keyword Category	Institutional Category ¹						TOTAL
	E	F	N	P	S	U	
Aerosols		1	1		1	6	9
Aldehydes	1		2		1	1	5
Allergens					2	1	3
Ammonia						1	1
Asbestos		1			2	1	4
Bacteria		1			2		3
Biocides						2	2
Biological	9	3			1	1	14
Chemical	6				1	2	9
Chlorinated HC			2		2	3	7
CO ₂	1	3			1	3	8
ETS	3	1	2		3	4	13
Fibers					1	1	2
Food Contamination			1			1	2
Formaldehyde	4	2	1		3	2	12
Fungi		1			2	1	4
Gases	7	1	4			1	13
Halogenated HC			1			1	2
Home Dust			1		1	2	4
Inorganic						2	2
Insecticides	2					2	4
Metals						3	3
MMMF					1		1
Mold					2	1	3
N-PAH			1				1
NO _x	3		2	6	1	7	19
Odors	2	1					3
Organic	1		3		1	2	7
Ozone	1	1				4	6
PAH	2		4			1	7
PM	11		4		1	5	21
Pollutants	7	1	4		4	3	19
Pollution			1				1
POM			2				2
Radioactivity		1	1				2
Radon	1	4	6		4	2	17
SO ₂			2			2	4
Solvents	1		2		1	5	9
SVOC	4		2			2	8
Vapors	2						2
VOC	13	3	7		6	4	33

¹Legend to Institutional Category:

E = Environmental Protection Agency

N = national laboratories

S = states

F = other Federal agencies

P = private research

U = universities

formaldehyde-related projects; universities, states, and EPA have the majority of ETS-related projects; and EPA has the largest number of biological-related projects.

Table 9 presents the specific keywords included in the keyword category Source and the number of projects associated with each of the keywords, by institutional category. The three most frequently reported sources were combustion (15), outdoor air (12), and building materials (11). Universities and EPA have the largest number of combustion-related projects; universities have the largest number of outdoor-air-related projects; and EPA has the largest number of projects related to building materials.

**TABLE 9. NUMBER OF PROJECTS BY INSTITUTIONAL CATEGORY
AND KEYWORDS RELATED TO SOURCES**

Keyword Category	Institutional Category ¹						TOTAL
	E	F	N	P	S	U	
Building Equipment						1	1
Building Materials	5	2	1		3		11
Combustion	5		1	1	3	5	15
Drinking Water			2		1	1	4
Dry Cleaning Shops						1	1
Filter Systems	3	1					4
Furniture	2					1	3
Gas Cookers				2		3	5
Harbor Sludge						1	1
Home Textiles	1				1		2
Household Products	3				1	1	5
Outdoor Air	1	3	2	2		4	12
Soil	1		3				4
Soil Characteristics			2			1	3
Sources	6		4		3	4	17
UFFI					2	1	3
Water						2	2

¹Legend to Institutional Category:

E = Environmental Protection Agency

F = other Federal agencies

N = national laboratories

P = private research

S = states

U = universities

SUMMARY

The results of this inventory provide the EPA and the NATO-CCMS with information on the directions of indoor air quality research in the United States, the funding levels of the projects, and the institutions conducting this research. This information can be useful to EPA in planning a future research program as required by the 1989 Report to Congress on Indoor Air Quality. The CCMS Indoor Air Quality Pilot Study can also benefit from this information by identifying research areas being addressed and specific researchers conducting work in a specific area. The inventory also provides information on research topics which are not being adequately addressed.

REFERENCES

1. Maroni, M. (1989a), "Background and Scope of the NATO-CCMS Pilot Study on Indoor Air Quality," in Pilot Study on Indoor Air Quality, Report on a meeting held in Erice, Italy, February 13-17, 1989.
2. Maroni, M. (1989b), "Inventory of Research and Regulations for Indoor Air Quality in NATO Countries," in Pilot Study on Indoor Air Quality, Report on a meeting held in Erice, Italy, February 13-17, 1989.
3. The Cost 613 form was obtained from Reference 2.
4. The keyword list used in the CEC inventory was obtained from Berndt Seifert, of the Institute for Water, Soil, and Air Hygiene, Federal Republic of Germany.
5. U.S. Environmental Protection Agency (1988), *Directory of State Indoor Air Contacts*. Washington, D.C.: Public Health Foundation.
6. *Air and Waste Management Association Directory and Resource Book 1988-1989*. Pittsburgh: Air and Waste Management Association.

APPENDIX A. KEYWORD LIST

GENERAL-PROJECT-OBJECTIVES-RELATED KEYWORDS

adsorption	(control) strategies
annual exposure	surfaces
bioaccumulation	TLV (threshold limit values)
concentrations	variations (of concentrations/exposure)
control	
control techniques	
cost/benefit (evaluations or calculations)	
diurnal	
dose	
electrostatic filters	
emissions	
energy conservation	
exposure	
guidelines	
indoor/outdoor ratios	
reactions	
reactive	
seasonal variations	
spatial variations	
standards	

SOURCE-RELATED KEYWORDS

sources (of pollution; if possible specify source)	screen printing plants
building equipment	soil
building materials	soil characteristics
combustion (sources)	UFFI (urea formaldehyde foam insulation)
dogs	water
drinking water	waterborne
dry cleaning shops	
external sources	
filter systems	
furniture	
gas cookers	
harbor sludge	
hobby activities	
hobby products	
outdoor air	
paints	
paraffin heaters	
pets	
plants	
refuse shots	
renovation	

CLIMATE/VENTILATION-RELATED KEYWORDS

ACS (air conditioning system)
air infiltration
air movement
climate (temperature and humidity)
condensation
forced ventilation
humidity
meteorological factors
meteorology
moisture
natural ventilation
temperature
ventilation

METHOD-RELATED KEYWORDS

analysis	passive samplers
animal study	representative survey
assessment	review
bioassay	sampling
biochemical monitoring	standardization
biological monitoring	subjective evaluation
chamber study	validation
(human) controlled exposure (study)	
database	
detection (of any parameter)	
detection methods	
development	
environmental monitoring	
epidemiological study	
epidemiology	
evaluation	
field measurements	
field trials	
interlaboratory comparison	
inventory	
investigations	
in vitro study	
measurement (of any parameter)	
measurement methods	
methods	
mice	
modeled approach	
models	
multizonal	

INDOOR-ENVIRONMENT-RELATED KEYWORDS

buildings (specify further if possible)
day-care centers
developing countries
dwellings
hospitals
industrial buildings
mobile homes
new buildings
offices
residences
schools (including nursery schools, universities, etc.)
sport establishments
swimming halls
temporary building
traffic related (environments, including cars)
underground

EFFECT- AND-OCCUPANT-RELATED KEYWORDS

airway	infestation
allergy	inhalation
asthma	irritation (mucous membranes, eyes, skin)
asthmatic	lung function
atopic	mutagenicity
(neuro) behavioral effects	nasal function
biochemical effects	neurotoxicity
bronchoreactivity	non-respiratory
cancer	nurses
carcinogenic	occupants
chemical sensitivity	other immune effects
children	other systemic (diseases)
CNSLD	physiological (reactions)
comfort	respiratory (effects)
complaint study	risk assessment, estimate, calculation
complaints (study, investigation)	analysis)
effects (add further specification if possible)	risk groups
elderly	SBS (sick-building syndrome
employees	investigation)
general population	sensory effects
(other) genotoxicity	susceptible groups
health	toxicological
hyperreactivity	toxicology
hypersensitivity	
immunotoxicity	
infection	

POLLUTANT-RELATED KEYWORDS

aerosols
aldehydes
allergens
ammonia
asbestos
bacterial
biocides
biological (pollution)
charged particles
chemical
chloramines
chlorinated dioxins
chlorinated H(ydro)C(arbons)
chlorine
CO₂
dioxin
ETS (environmental tobacco smoke)
fibers
food contamination
formaldehyde
fungi
gamma radiation
gases
halogenated H(ydro)C(arbons)
HCHO (formaldehyde)
home dust
inorganic (chemical)
insecticides
ions
isocyanates
lindane
metals
mites
MMMF (man-made mineral fibers)
mold
noise
NO_x (NO₂, NO)
N-PAH
odors
organic (chemical)
other microorganisms
ozone
PAH (polycyclic aromatic hydrocarbons)
PCB (polychlorinated biphenyls)
PCP (pentachlorophenol)
perchloroethylene
PM (particulate matter)
pollution
pollutants
POM (particulate organic matter, organics extractable from particulate matter)
radioactivity
radon
SO₂
solvents
styrene
suspended particulates
SVOC (semivolatile organic compounds)
tetrachloroethylene (perchloroethylene)
vapors
VOC (volatile organic compounds)

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VOLUME 10
PART 1
1900

**APPENDIX B. 1990 INDOOR AIR QUALITY
RESEARCH PROJECTS**

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: AIR AND ENERGY ENGINEERING RESEARCH LABORATORY

FORM NO.E001

PRINCIPAL INVESTIGATOR: JACKSON, MERRILL D.

END DATE: ONGOING

TITLE: EVALUATION OF SOURCE MANAGEMENT OPTIONS FOR IAQ
CONTROL

FUNDING: 200 K/YR

FORM NO.E002

PRINCIPAL INVESTIGATOR: SPARKS, LESLIE E.

END DATE: 1993

TITLE: METHODS DEVELOPMENT FOR IAQ CONTROL

FUNDING: 250 K/YR

FORM NO.E003

PRINCIPAL INVESTIGATOR: SPARKS, LESLIE E.

END DATE: ONGOING

TITLE: EVALUATION OF AIR CLEANERS FOR IAQ CONTROL

FUNDING: 300 K/YR

FORM NO.E004

PRINCIPAL INVESTIGATOR: TUCKER, W. GENE

END DATE: 1995

TITLE: METHODS DEVELOPMENT FOR SOURCE CHARACTERIZATION

FUNDING: 300 K/YR

FORM NO.E005

PRINCIPAL INVESTIGATOR: SPARKS, LESLIE E.

END DATE: ONGOING

TITLE: EVALUATION OF VENTILATION FOR IAQ CONTROL

FUNDING: 100 K/YR

FORM NO.E006

PRINCIPAL INVESTIGATOR: TICHENOR, BRUCE A.

END DATE: ONGOING

TITLE: SOURCE CHARACTERIZATION RESEARCH

FUNDING: 500 K/YR

FORM NO.E007

PRINCIPAL INVESTIGATOR: TUCKER, W. GENE

END DATE: ONGOING

TITLE: INDOOR AIR SOURCE CHARACTERIZATION

FUNDING: 508 K/YR

FORM NO.E008

PRINCIPAL INVESTIGATOR: TUCKER, W. GENE

END DATE: ONGOING

TITLE: INDOOR AIR QUALITY CONTROL

FUNDING: 338 K/YR

TOTAL FUNDING FOR INSTITUTION: 2496 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: ATMOSPHERIC RESEARCH AND EXPOSURE ASSESSMENT LABORATORY

FORM NO.E009

PRINCIPAL INVESTIGATOR: IRWIN, JOHN S.

END DATE: ONGOING

TITLE: DEVELOP AND VALIDATE COMPUTER ASSISTED SOFTWARE FOR
UPGRADED NIST INDOOR DISPERSION/VENTILATION MODEL

FUNDING: 0 K/YR

FORM NO.E010

PRINCIPAL INVESTIGATOR: BENNETT, BERNE I.

END DATE: ONGOING

TITLE: DEVELOP AND VALIDATE QUALITY ASSURANCE STANDARDS

FUNDING: 27 K/YR

FORM NO.E011

PRINCIPAL INVESTIGATOR: MCELROY, FRANK

END DATE: ONGOING

TITLE: COMPENDIUM OF INDOOR AIR QUALITY METHODS

FUNDING: 43 K/YR

FORM NO.E012

PRINCIPAL INVESTIGATOR: HIGHSMITH, ROSS

END DATE: ONGOING

TITLE: MONITORING METHODS DEVELOPMENT

FUNDING: 55 K/YR

FORM NO.E013

PRINCIPAL INVESTIGATOR: WILSON, NANCY K.

END DATE: ONGOING

TITLE: ANALYTICAL METHODS DEVELOPMENT

FUNDING: 80 K/YR

FORM NO.E014

PRINCIPAL INVESTIGATOR: HIGHSMITH, ROSS

END DATE: ONGOING

TITLE: LARGE BUILDING STUDIES

FUNDING: 345 K/YR

TOTAL FUNDING FOR INSTITUTION: 549 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE

FORM NO.E015

PRINCIPAL INVESTIGATOR: BERRY, MICHAEL A.

END DATE: ONGOING

TITLE: INDOOR AIR PROGRAM MANAGEMENT, COORDINATION AND
RESEARCH COMMUNITY SUPPORT

FUNDING: 75 K/YR

FORM NO.E016

PRINCIPAL INVESTIGATOR: BERRY, MICHAEL A.

END DATE: ONGOING

TITLE: RISK CHARACTERIZATION METHODOLOGY AND RISK
ASSESSMENT

FUNDING: 155 K/YR

FORM NO.E017

PRINCIPAL INVESTIGATOR: CHILDS, NORMAN E.

END DATE: ONGOING

TITLE: PUBLICATION OF THE INDOOR AIR REFERENCE
BIBLIOGRAPHY

FUNDING: 15 K/YR

TOTAL FUNDING FOR INSTITUTION: 245 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: HEALTH EFFECTS RESEARCH LABORATORY

FORM NO.E018

PRINCIPAL INVESTIGATOR: GOLDSTEIN, GEORGE M.

END DATE: ONGOING

TITLE: NEUROBEHAVIORAL, RESPIRATORY AND SENSORY IRRITANT
EFFECTS OF COMPLEX VOC MIXTURES IN HUMANS

FUNDING: 500 K/YR

FORM NO.E019

PRINCIPAL INVESTIGATOR: LEWTAS, JOELLEN

END DATE: ONGOING

TITLE: BIOLOGICAL MARKERS FOR ENVIRONMENTAL TOBACCO SMOKE
(ETS) EXPOSURE AND DOSIMETRY IN CHILDREN AND ADULTS

FUNDING: 315 K/YR

FORM NO.E020

PRINCIPAL INVESTIGATOR: GOLDSTEIN, GEORGE M.

END DATE: ONGOING

TITLE: TOXICOLOGICAL EFFECTS OF VOC MIXTURES IN ANIMAL AND
IN VITRO SYSTEMS

FUNDING: 159 K/YR

TOTAL FUNDING FOR INSTITUTION: 974 K/YR

TOTAL FUNDING FOR E: 4264 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

FORM NO.F001

PRINCIPAL INVESTIGATOR: HURRELL, JOSEPH J.

END DATE: FY91

TITLE: DEVELOPMENT OF SURVEY ASSESSMENT INSTRUMENT FOR IAQ

FUNDING: 25 K/YR

FORM NO.F002

PRINCIPAL INVESTIGATOR: RENTOS, PETE

END DATE: ONGOING

TITLE: EDUCATIONAL MODULES FOR TRANSFERRING RESEARCH RESULTS

FUNDING: 70 K/YR

FORM NO.F003

PRINCIPAL INVESTIGATOR: SUNDIN, DAVID

END DATE: ONGOING

TITLE: HEALTH HAZARD EVALUATIONS ON INDOOR AIR QUALITY

FUNDING: 150 K/YR

FORM NO.F004

PRINCIPAL INVESTIGATOR: CRANDALL, MICHAEL

END DATE: FY90

TITLE: LIBRARY OF CONGRESS INDOOR AIR QUALITY STUDY

FUNDING: 120 K/YR

FORM NO.F005

PRINCIPAL INVESTIGATOR: BURKHART, GRET A.

END DATE: ONGOING

TITLE: FEASIBILITY OF CONDUCTING EPIDEMIOLOGIC STUDIES OF BUILDING RELATED ILLNESS

FUNDING: 10 K/YR

FORM NO.F006

PRINCIPAL INVESTIGATOR: KENNEDY, EUGENE

END DATE: FY92

TITLE: METHOD FOR SAMPLING AND ANALYSIS OF INDOOR AIR FOR ORGANIC COMPOUNDS

FUNDING: 17 K/YR

FORM NO.F007

PRINCIPAL INVESTIGATOR: ANASTAS, MAZEN

END DATE: FY91

TITLE: METHODS FOR EVALUATING INDOOR AIR VENTILATION SYSTEMS

FUNDING: 30 K/YR

TOTAL FUNDING FOR INSTITUTION: 422 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

FORM NO.F008

PRINCIPAL INVESTIGATOR: PERSILY, ANDREW K.

END DATE: FY90

TITLE: EFFICIENCY OF GASEOUS CONTAMINANT REMOVAL DEVICES

FUNDING: 33 K/YR

FORM NO.F009

PRINCIPAL INVESTIGATOR: PERSILY, ANDREW K.

END DATE: ONGOING

TITLE: INFILTRATION AND VENTILATION IN LARGE BUILDINGS

FUNDING: 29 K/YR

FORM NO.F010

PRINCIPAL INVESTIGATOR: PERSILY, ANDREW K.

END DATE: ONGOING

TITLE: INDOOR AIR POLLUTION CONCENTRATION MODEL

FUNDING: 31 K/YR

TOTAL FUNDING FOR INSTITUTION: 94 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: U.S. DEPARTMENT OF ENERGY

FORM NO.F011

PRINCIPAL INVESTIGATOR: JACKSON, MARK
TITLE: RESIDENTIAL VENTILATION RESEARCH PROJECT
FUNDING: 184 K/YR

END DATE: 1993

FORM NO.F012

PRINCIPAL INVESTIGATOR: JACKSON, MARK
TITLE: SINGLE FAMILY VENTILATION CASE STUDIES
FUNDING: 80 K/YR

END DATE: 1992

FORM NO.F013

PRINCIPAL INVESTIGATOR: JACKSON, MARK
TITLE: SUPER GOOD CENTS MULTIFAMILY VENTILATION
FUNDING: 170 K/YR

END DATE: 1992

FORM NO.F014

PRINCIPAL INVESTIGATOR: STEELE, TIM
TITLE: ADOPTION AND INTERPRETATION OF ASHRAE STANDARD
62-1989
FUNDING: 0 K/YR

END DATE: 6/1990

FORM NO.F015

PRINCIPAL INVESTIGATOR: EASTWOOD, CHARLES
TITLE: DEVELOPMENT OF AN EXPERT SYSTEM FOR RESIDENTIAL
RADON MITIGATION
FUNDING: 72 K/YR

END DATE: 6/1991

FORM NO.F016

PRINCIPAL INVESTIGATOR: EASTWOOD, CHARLES
TITLE: INFLUENCE OF SUBSLAB AGGREGATE PERMEABILITY ON THE
PERFORMANCE OF RADON SUBSLAB VENTILATION MITIGATION
SYSTEMS
FUNDING: 70 K/YR

END DATE: 3/1991

TOTAL FUNDING FOR INSTITUTION: 576 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

FORM NO.F017

PRINCIPAL INVESTIGATOR: ARNOLTS, CONRAD C.

END DATE: 12/1990

TITLE: RADON TESTING AND EVALUATION IN MULTISTORY
RESIDENTIAL BUILDINGS

FUNDING: 70 K/YR

TOTAL FUNDING FOR INSTITUTION: 70 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: U.S. DEPARTMENT OF TRANSPORTATION

FORM NO.F018

PRINCIPAL INVESTIGATOR: NAGDA, NIREN

END DATE:

TITLE: AIRLINER CABIN ENVIRONMENT: CONTAMINANT MEASURES,
HEALTH RISKS, AND MITIGATION OPTIONS

FUNDING: 0 K/YR

TOTAL FUNDING FOR INSTITUTION: 0 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: NASA - STENNIS SPACE CENTER

FORM NO.F019

PRINCIPAL INVESTIGATOR: JOHNSON, ANNE H.

END DATE: ONGOING

TITLE: REDUCTION OF VOCs BY FOLIAGE PLANTS AND ASSOCIATED
MICROBIAL POPULATIONS

FUNDING: 0 K/YR

TOTAL FUNDING FOR INSTITUTION: 0 K/YR

TOTAL FUNDING FOR F: 1161 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: ARGONNE NATIONAL LABORATORY

FORM NO.N001

PRINCIPAL INVESTIGATOR: SCHLENKER, ROBERT A.

END DATE: ONGOING

TITLE: ASSESSMENT OF THORON AND THORON DAUGHTER PRODUCTS

FUNDING: 94 K/YR

TOTAL FUNDING FOR INSTITUTION: 94 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: LAWRENCE BERKELEY LABORATORY

FORM NO.N002

PRINCIPAL INVESTIGATOR: NERO, ANTHONY V.
TITLE: AIR POLLUTANT EXPOSURES IN BUILDINGS
FUNDING: 15 K/YR

END DATE: ONGOING

FORM NO.N003

PRINCIPAL INVESTIGATOR: DAISEY, JOAN M.
TITLE: INFILTRATION, VENTILATION AND INDOOR AIR QUALITY
FUNDING: 67 K/YR

END DATE: ONGOING

FORM NO.N004

PRINCIPAL INVESTIGATOR: DAISEY, JOAN M.
TITLE: INDOOR ATMOSPHERIC CHEMISTRY: INTERACTIONS OF RADON
WITH OTHER GASEOUS POLLUTANTS
FUNDING: 81 K/YR

END DATE: ONGOING

FORM NO.N005

PRINCIPAL INVESTIGATOR: DAISEY, JOAN M.
TITLE: MECHANISM-BASED RISK ASSESSMENT FOR INDOOR AIR
EXPOSURES
FUNDING: 50 K/YR

END DATE: ONGOING

FORM NO.N006

PRINCIPAL INVESTIGATOR: SHERMAN, MAX H.
TITLE: VENTILATION MEASUREMENT TECHNIQUES
FUNDING: 38 K/YR

END DATE: ONGOING

FORM NO.N007

PRINCIPAL INVESTIGATOR: MODERA, MARK P.
TITLE: AIR LEAKAGE IN BUILDINGS
FUNDING: 15 K/YR

END DATE: ONGOING

FORM NO.N008

PRINCIPAL INVESTIGATOR: FEUSTEL, HELMUT E.
TITLE: AIR FLOW MODELLING
FUNDING: 20 K/YR

END DATE: ONGOING

FORM NO.N009

PRINCIPAL INVESTIGATOR: TRAYNOR, GREGORY W.
TITLE: DEVELOPMENT OF A CARBON MONOXIDE PASSIVE SAMPLER
FUNDING: 90 K/YR

END DATE: FY92

1990 INDOOR AIR RESEARCH PROJECTS

FORM NO.N010

PRINCIPAL INVESTIGATOR: TRAYNOR, GREGORY W.

END DATE: FY91

TITLE: CONCENTRATIONS OF INDOOR POLLUTANTS (CIP) DATA BASE

FUNDING: 40 K/YR

FORM NO.N011

PRINCIPAL INVESTIGATOR: TRAYNOR, GREGORY W.

END DATE: FY97

TITLE: SIMULATION MODELING OF INDOOR AIR POLLUTANT
CONCENTRATIONS (MACROMODEL)

FUNDING: 200 K/YR

FORM NO.N012

PRINCIPAL INVESTIGATOR: DAISEY, JOAN M.

END DATE: FY91

TITLE: ASSESSMENTS OF EXPOSURES TO CANDIDATE VOLATILE
ORGANIC CONTAMINANTS IN INDOOR AIR

FUNDING: 40 K/YR

FORM NO.N013

PRINCIPAL INVESTIGATOR: SEXTRO, R.G.

END DATE: ONGOING

TITLE: EXPERIMENTAL AND THEORETICAL INVESTIGATIONS OF
RADON AVAILABILITY, TRANSPORT, AND ENTRY

FUNDING: 250 K/YR

FORM NO.N014

PRINCIPAL INVESTIGATOR: NERO, ANTHONY V.

END DATE: ONGOING

TITLE: CHARACTERIZATION OF AIRBORNE RADON CONCENTRATIONS

FUNDING: 41 K/YR

TOTAL FUNDING FOR INSTITUTION: 947 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: LAWRENCE LIVERMORE NATIONAL LABORATORY

FORM NO. N015

PRINCIPAL INVESTIGATOR: MCKONE, THOMAS E.

END DATE: ONGOING

TITLE: EVALUATION OF RESIDENTIAL EXPOSURE TO ORGANIC
CHEMICALS IN TAP WATER AND SOIL

FUNDING: 200 K/YR

TOTAL FUNDING FOR INSTITUTION: 200 K/YR

TOTAL FUNDING FOR N: 1241 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: DAMES AND MOORE

FORM NO.P001

PRINCIPAL INVESTIGATOR: TOTZKE, DENNY

END DATE: ONGOING

TITLE: HUMIDITY/AIR EXCHANGE STUDY IN MOBILE HOMES

FUNDING: 50 K/YR

TOTAL FUNDING FOR INSTITUTION: 50 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: GAS RESEARCH INSTITUTE

FORM NO.P002

PRINCIPAL INVESTIGATOR: NAGDA, N.

END DATE: 10/1990

TITLE: QUANTIFICATION OF FACTORS AFFECTING INDOOR AIR
QUALITY

FUNDING: 371 K/YR

FORM NO.P003

PRINCIPAL INVESTIGATOR: COERR, STANTON

END DATE: 3/1991

TITLE: REGULATORY EVALUATION OF INDOOR AIR QUALITY ISSUES
AND TECHNOLOGY TRANSFER

FUNDING: 96 K/YR

FORM NO.P004

PRINCIPAL INVESTIGATOR: GRUMBLY, T.

END DATE: 6/1992

TITLE: NITROGEN DIOXIDE EXPOSURE AND SUSCEPTIBILITY TO
RESPIRATORY INFECTIONS

FUNDING: 238 K/YR

FORM NO.P005

PRINCIPAL INVESTIGATOR: REUTHER, J.

END DATE: 4/1990

TITLE: EVALUATION OF NO2 PROTOCOL AND BURNER EMISSIONS

FUNDING: 111 K/YR

FORM NO.P006

PRINCIPAL INVESTIGATOR: LESLIE, N.

END DATE: 7/1992

TITLE: CONVENTIONAL ENERGY RESEARCH HOUSE

FUNDING: 254 K/YR

FORM NO.P007

PRINCIPAL INVESTIGATOR: SPENGLER, J.D.

END DATE: 5/1990

TITLE: ASSESSMENT OF PUBLIC TOTAL EXPOSURE TO SELECTED
EMISSIONS SPECIES CONTRIBUTED IN PART BY INDOOR
SOURCES

FUNDING: 398 K/YR

FORM NO.P008

PRINCIPAL INVESTIGATOR: SPICER, C.W.

END DATE: 3/1991

TITLE: INVESTIGATION OF NITROGEN DIOXIDE REMOVAL FROM
INDOOR AIR

FUNDING: 89 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

FORM NO. P009

PRINCIPAL INVESTIGATOR: WALKINSHAW, D.

END DATE: 9/1990

TITLE: PARTIAL FUNDING FOR 5TH INTERNATIONAL CONFERENCE ON
INDOOOR AIR QUALITY

FUNDING: 25 K/YR

TOTAL FUNDING FOR INSTITUTION: 1581 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: LOS AMIGOS RESEARCH AND EDUCATION INSTITUTE, INC.

FORM NO.P010

PRINCIPAL INVESTIGATOR: HACKNEY, JACK D.

END DATE: 1992

TITLE: FIELD STUDIES OF RESPIRATORY HEALTH STATUS AND
IRRITANT EXPOSURES IN ASTHMATIC VOLUNTEERS

FUNDING: 75 K/YR

FORM NO.P011

PRINCIPAL INVESTIGATOR: HACKNEY, JACK D.

END DATE: 1990

TITLE: EFFECTS OF NO2 IN VOLUNTEERS WITH CHRONIC
OBSTRUCTIVE PULMONARY DISEASE - A COMBINED FIELD
MONITORING AND CHAMBER EXPOSURE STUDY

FUNDING: 180 K/YR

TOTAL FUNDING FOR INSTITUTION: 255 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: RAND CORPORATION

FORM NO.P012

PRINCIPAL INVESTIGATOR: DUAN, NAIHUA

END DATE: 4/1991

TITLE: STUDY ON STATISTICS AND ENVIRONMENTAL FACTORS IN
HEALTH

FUNDING: 35 K/YR

TOTAL FUNDING FOR INSTITUTION: 35 K/YR

TOTAL FUNDING FOR I: 1921 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: CENTER FOR INDOOR AIR RESEARCH

FORM NO.P013

PRINCIPAL INVESTIGATOR: GREENFIELD, S. M.

END DATE: 8/1990

TITLE: DEVELOPING ENHANCED INDOOR AIR QUALITY MODELS

FUNDING: 35 K/YR

FORM NO.P014

PRINCIPAL INVESTIGATOR: BASCOM, REBECCA

END DATE: 1/1994

TITLE: ETS: NASAL RESPONSE AND AEROSOL DEPOSITION EFFECT

FUNDING: 123 K/YR

FORM NO.P015

PRINCIPAL INVESTIGATOR: AREY, JANET

END DATE: 5/1991

TITLE: INDOOR FATE AND TRANSFORMATION OF SELECTED
NITROGENOUS ORGANIC COMPOUNDS

FUNDING: 180 K/YR

FORM NO.P016

PRINCIPAL INVESTIGATOR: DAVIS, JERRY K.

END DATE: 3/1993

TITLE: EFFECTS OF ETS AND NO2 ON RESPIRATORY INFECTION:
MURINE MODEL DEVELOPMENT

FUNDING: 151 K/YR

FORM NO.P017

PRINCIPAL INVESTIGATOR: ETAUGH, DELBERT J.

END DATE: 1/1992

TITLE: MUTAGENICITY OF GAS AND PARTICULATE PHASE COMPOUNDS
IN ETS: DEVELOPMENT OF AN SFE/SFC-BIOASSAY
ANALYTICAL TECHNIQUE

FUNDING: 113 K/YR

FORM NO.P018

PRINCIPAL INVESTIGATOR: GUNNISON, ALBERT T.

END DATE: 12/1992

TITLE: EFFECTS OF O3, NO2, AND ETS ON PULMONARY FUNCTION
AND EICOSANOID METABOLISM

FUNDING: 284 K/YR

FORM NO.P019

PRINCIPAL INVESTIGATOR: HALEY, NANCY J.

END DATE: 6/1993

TITLE: DETERMINATION OF NICOTINE METABOLITES BY
IMMUNOCHEMICAL METHODS

FUNDING: 96 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

FORM NO.P020
PRINCIPAL INVESTIGATOR: BOWMAN, K. O.
TITLE: EFFICIENT LABORATORY EXPERIMENTS FOR TESTING
MUTAGENICITY OF COMPONENTS OF INDOOR AMBIENT AIR
FUNDING: 69 K/YR
END DATE: 3/1993

FORM NO.P021
PRINCIPAL INVESTIGATOR: KLEEGERGER, STEVEN R.
TITLE: SUSCEPTIBILITY OF OZONE-INDUCED AIRWAY INFLAMMATION
FUNDING: 152 K/YR
END DATE: 6/1993

FORM NO.P022
PRINCIPAL INVESTIGATOR: LAST, JEROLD A.
TITLE: TOXICOLOGICAL INTERACTIONS BETWEEN THE INDOOR AIR
POLLUTANT NO2 AND O3
FUNDING: 297 K/YR
END DATE: 12/1992

FORM NO.P023
PRINCIPAL INVESTIGATOR: LAY, JACKSON O.
TITLE: DEVELOPMENT OF FAST ATOM BOMBARDMENT MASS SPECTRAL
TECHNIQUES FOR THE IDENTIFICATION OF UNKNOWN
CARCINOGEN-NUCLEOSIDE ADDUCTS
FUNDING: 133 K/YR
END DATE: 12/1991

FORM NO.P024
PRINCIPAL INVESTIGATOR: LEHRER, SAMUEL B.
TITLE: PULMONARY EFFECTS OF ENVIRONMENTAL SMOKE EXPOSURE
ON ASTHMATIC SUBJECTS
FUNDING: 325 K/YR
END DATE: 12/1992

FORM NO.P025
PRINCIPAL INVESTIGATOR: LEIKAUF, GEORGE D.
TITLE: INDOOR ALDEHYDES AND BRONCHIAL HYPERACTIVITY
FUNDING: 264 K/YR
END DATE: 12/1992

FORM NO.P026
PRINCIPAL INVESTIGATOR: MERCER, ROBERT R.
TITLE: INJURY IN GAS EXCHANGE UNITS DUE TO LOW LEVEL
NITROGEN DIOXIDE
FUNDING: 167 K/YR
END DATE: 6/1993

FORM NO.P027
PRINCIPAL INVESTIGATOR: O'ROURKE, MARY KAY
TITLE: INDOOR BIOLOGICAL AGENTS: EXPOSURES AND RESPONSES
IN ALLERGY AND ASTHMA
FUNDING: 229 K/YR
END DATE: 12/1992

1990 INDOOR AIR RESEARCH PROJECTS

FORM NO. P028

PRINCIPAL INVESTIGATOR: PENN, ARTHUR

END DATE: 12/1992

TITLE: DOES ETS PROMOTE ARTERIOSCLEROSIS OR ACT AS A
CO-ATHEROGEN

FUNDING: 253 K/YR

FORM NO. P029

PRINCIPAL INVESTIGATOR: PINKERTON, KENT E.

END DATE: 12/1992

TITLE: EFFECTS OF ETS ON PRENATAL AND PERINATAL LUNG
DEVELOPMENT

FUNDING: 268 K/YR

FORM NO. P030

PRINCIPAL INVESTIGATOR: POSTLEWAITE, EDWARD M.

END DATE: 6/1993

TITLE: PULMONARY REACTIVE UPTAKE OF INHALED TOXIC
CONTAMINANTS

FUNDING: 122 K/YR

FORM NO. P031

PRINCIPAL INVESTIGATOR: PRITCHARD, J. N.

END DATE: 3/1993

TITLE: THE REGIONAL DEPOSITION OF ETS AND ITS INFLUENCE ON
RADON DOSIMETRY

FUNDING: 80 K/YR

FORM NO. P032

PRINCIPAL INVESTIGATOR: PRITCHARD, J. N.

END DATE: 4/1991

TITLE: THE FATE OF NICOTINE DURING "AGING" OF
ENVIRONMENTAL TOBACCO SMOKE

FUNDING: 120 K/YR

FORM NO. P033

PRINCIPAL INVESTIGATOR: RYAN, P. BARRY

END DATE: 6/1993

TITLE: INVESTIGATIONS OF OZONE CHEMISTRY IN INDOOR
ENVIRONMENTS

FUNDING: 109 K/YR

FORM NO. P034

PRINCIPAL INVESTIGATOR: RYLANDER, RAGNER

END DATE: 6/1991

TITLE: INFLAMMATORY RESPONSES AFTER INDOOR EXPOSURE TO
AIRBORNE GLUCAN AND ENDOTOXIN

FUNDING: 103 K/YR

FORM NO. P035

PRINCIPAL INVESTIGATOR: SHAUGHNESSY, RICHARD J.

END DATE: 8/1992

TITLE: EVALUATION OF EFFECTIVENESS OF PORTABLE INDOOR AIR
CLEANING SYSTEMS

FUNDING: 107 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

FORM NO.P036

PRINCIPAL INVESTIGATOR: SOLOMON, JEROME J.

TITLE: GENOTOXICITY OF EPOXIDE INDUCED 3-HYDROXYALKYL
URACIL

FUNDING: 243 K/YR

END DATE: 6/1993

FORM NO.P037

PRINCIPAL INVESTIGATOR: WILLEKE, KLAUS

TITLE: NEW BIOAEROSOL SAMPLING TECHNIQUES FOR INDOOR
ENVIRONMENTS

FUNDING: 167 K/YR

END DATE: 6/1993

FORM NO.P038

PRINCIPAL INVESTIGATOR: WITSCHI, HANSPETER

TITLE: NEUROENDORINE LUNG CANCER: MECHANISTIC STUDIES

FUNDING: 172 K/YR

END DATE: 8/1993

TOTAL FUNDING FOR INSTITUTION: 4360 K/YR

TOTAL FUNDING FOR P: 4360 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: CALIFORNIA DEPARTMENT OF HEALTH SERVICES

FORM NO.S001

PRINCIPAL INVESTIGATOR: ALEVANTIS, LEON
TITLE: STUDIES OF VENTILATION EFFICIENCY
FUNDING: 20 K/YR

END DATE: ONGOING

FORM NO.S002

PRINCIPAL INVESTIGATOR: HAYWARD, STEVEN B.
TITLE: INDOOR AIR QUALITY INTERAGENCY WORKING GROUP
FUNDING: 0 K/YR

END DATE: ONGOING

FORM NO.S003

PRINCIPAL INVESTIGATOR: GIRMAN, JOHN R.
TITLE: BAKE-OUT OF OFFICE BUILDINGS TO REDUCE EMISSIONS OF
VOLATILE ORGANIC COMPOUNDS
FUNDING: 30 K/YR

END DATE: ONGOING

FORM NO.S004

PRINCIPAL INVESTIGATOR: GIRMAN, JOHN R.
TITLE: EMISSIONS AND MODELING EXPOSURES OF TCE FROM
CORRECTION FLUID
FUNDING: 130 K/YR

END DATE: 6/1990

FORM NO.S005

PRINCIPAL INVESTIGATOR: GIRMAN, JOHN R.
TITLE: VOC EMISSIONS FROM ART-SUPPLIES
FUNDING: 130 K/YR

END DATE: 1/1991

FORM NO.S006

PRINCIPAL INVESTIGATOR: GIRMAN, JOHN R.
TITLE: VOC SAMPLING AND ANALYSIS METHOD DEVELOPMENT
FUNDING: 60 K/YR

END DATE:

FORM NO.S007

PRINCIPAL INVESTIGATOR: GIRMAN, JOHN R.
TITLE: CAUSES OF ACCIDENTAL CARBON MONOXIDE POISONINGS IN
CALIFORNIA
FUNDING: 100 K/YR

END DATE: 1/1991

FORM NO.S008

PRINCIPAL INVESTIGATOR: KAI-SHEN, LIU
TITLE: ESTIMATING DISTRIBUTIONS OF RADON EXPOSURE IN
CALIFORNIA
FUNDING: 100 K/YR

END DATE: 3/1991

1990 INDOOR AIR RESEARCH PROJECTS

FORM NO.S009

PRINCIPAL INVESTIGATOR: HAYWARD, STEVEN B.

END DATE: 10/1990

TITLE: RADON CONCENTRATIONS IN RESIDENCES IN VENTURA
COUNTY AND NORTHWESTERN LOS ANGELES COUNTY

FUNDING: 100 K/YR

FORM NO.S010

PRINCIPAL INVESTIGATOR: MACHER, JANET

END DATE: ONGOING

TITLE: STUDIES OF THE EFFECTIVENESS OF UV RADIATION FOR TB
CONTACT

FUNDING: 30 K/YR

FORM NO.S011

PRINCIPAL INVESTIGATOR: MACHER, JANET

END DATE:

TITLE: STUDIES OF INDOOR MICROBIOLOGICAL CONTAMINATION

FUNDING: 30 K/YR

TOTAL FUNDING FOR INSTITUTION: 730 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: MARYLAND DEPARTMENT OF THE ENVIRONMENT

FORM NO.S012

PRINCIPAL INVESTIGATOR: FARRELL, KATHERINE P.

END DATE: 4/1990

TITLE: MARYLAND INDOOR AIR QUALITY TASK FORCE REPORT
"INDOOR AIR QUALITY, A COMMON SENSE APPROACH"

FUNDING: 10 K/YR

TOTAL FUNDING FOR INSTITUTION: 10 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: MINNESOTA DEPARTMENT OF HEALTH

FORM NO.S013

PRINCIPAL INVESTIGATOR: OATMAN, LAURA

END DATE: 6/1991

TITLE: INDOOR AIR QUALITY ASSESSMENT PROTOCOL

FUNDING: 54 K/YR

FORM NO.S014

PRINCIPAL INVESTIGATOR: MARBURY, MARIAN C.

END DATE: 1993

TITLE: EPIDEMIOLOGY OF RESPIRATORY ILLNESS AND INDOOR
POLLUTION

FUNDING: 88 K/YR

TOTAL FUNDING FOR INSTITUTION: 142 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: NEW JERSEY DEPARTMENT OF HEALTH

FORM NO.S015

PRINCIPAL INVESTIGATOR: MILLER, STEVEN M.

END DATE: FY91

TITLE: ASSESSMENT OF NEW JERSEY'S COMMERCIAL LABORATORY
INDOOR AIR ANALYSIS CAPABILITIES

FUNDING: 25 K/YR

FORM NO.S016

PRINCIPAL INVESTIGATOR: SCHOENBERG, JANET B.

END DATE: FY91

TITLE: CASE CONTROL STUDY OF RADON AND LUNG CANCER IN NEW
JERSEY WOMEN

FUNDING: 120 K/YR

TOTAL FUNDING FOR INSTITUTION: 145 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: TEXAS DEPARTMENT OF HEALTH

FORM NO.S017

PRINCIPAL INVESTIGATOR: STAHL, QUADE R.

END DATE: ONGOING

TITLE: INDOOR AIR PROGRAM (MAINLY SURVEILLANCE)

FUNDING: 0 K/YR

TOTAL FUNDING FOR INSTITUTION: 0 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: WISCONSIN DEPARTMENT OF HEALTH AND SOCIAL SERVICES

FORM NO.S018

PRINCIPAL INVESTIGATOR: OTTO, WILLIAM H.

END DATE: 1990

TITLE: INHALATION EXPOSURE FROM VOLATILE ORGANIC COMPOUNDS
FOUND IN DRINKING WATER

FUNDING: 2 K/YR

TOTAL FUNDING FOR INSTITUTION: 2 K/YR

TOTAL FUNDING FOR S: 1029 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: BRIGHAM YOUNG UNIVERSITY

FORM NO.U001

PRINCIPAL INVESTIGATOR: EUTAGH, DELBERT J.

END DATE: 6/1990

TITLE: EXPOSURE-DOSE RELATIONSHIPS FOR ENVIRONMENTAL
TOBACCO SMOKE

FUNDING: 150 K/YR

FORM NO.U002

PRINCIPAL INVESTIGATOR: EUTAGH, DELBERT J.

END DATE: 6/1990

TITLE: AIR QUALITY IN COMMERCIAL AIRCRAFT

FUNDING: 113 K/YR

TOTAL FUNDING FOR INSTITUTION: 263 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: HARVARD SCHOOL OF PUBLIC HEALTH

FORM NO.U003

PRINCIPAL INVESTIGATOR: SPENGLER, JOHN

END DATE: 2010

TITLE: SEVERAL EXPOSURE AND HEALTH STUDIES RELATED TO A
VARIETY OF CONTAMINANTS AND MICROENVIRONMENTS
(HOMES, OFFICES, VEHICLES, ETC.)

FUNDING: 500 K/YR

FORM NO.U004

PRINCIPAL INVESTIGATOR: KOUTRAKIS, PETROS

END DATE: 3/1991

TITLE: INVESTIGATIONS OF PHYSICAL AND CHEMICAL PROCESSES
AFFECTING INDOOR HUMAN EXPOSURES TO ACIDS AND OTHER
RELATED POLLUTANTS

FUNDING: 200 K/YR

TOTAL FUNDING FOR INSTITUTION: 700 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: RUTGERS UNIVERSITY

FORM NO.U005

PRINCIPAL INVESTIGATOR: FENSKE, RICHARD

END DATE: 10/1992

TITLE: PESTICIDE EXPOSURE TO CHILDREN IN THE HOME
FOLLOWING INDOOR PESTICIDE APPLICATIONS

FUNDING: 100 K/YR

FORM NO.U006

PRINCIPAL INVESTIGATOR: FENSKE, RICHARD

END DATE: 5/1990

TITLE: MINIMIZING DERMAL AND RESPIRATORY EXPOSURES TO
PESTICIDES IN GREENHOUSES

FUNDING: 33 K/YR

FORM NO.U007

PRINCIPAL INVESTIGATOR: LIOY, PAUL J.

END DATE: ONGOING

TITLE: RESEARCH ON TOTAL EXPOSURE

FUNDING: 200 K/YR

TOTAL FUNDING FOR INSTITUTION: 333 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: UNIVERSITY OF ARIZONA COLLEGE OF MEDICINE

FORM NO.U008

PRINCIPAL INVESTIGATOR: LEBOWITZ, MICHAEL D.

END DATE: ONGOING

TITLE: PM, OZONE, INDOOR POLLUTANTS AND RESPIRATORY
RESPONSE - TO STUDY ACUTE HEALTH, SUB-CHRONIC, AND
CHRONIC EFFECTS OF INDOOR/OUTDOOR EXPOSURES

FUNDING: 250 K/YR

FORM NO.U009

PRINCIPAL INVESTIGATOR: LEBOWITZ, MICHAEL D.

END DATE: ONGOING

TITLE: NO2, PM AND RESPIRATORY RESPONSES IN ASTHMATICS TO
STUDY INDOOR/OUTDOOR AND TOTAL EXPOSURES TO SHORT
TERM NO2 AND DAILY PM; AND RESPIRATORY
FUNCTION/SYMPTOMS IN SUSCEPTIBLE INDIVIDUALS

FUNDING: 150 K/YR

FORM NO.U010

PRINCIPAL INVESTIGATOR: O'ROURKE, MARY KAY

END DATE: 12/1994

TITLE: INDOOR BIOLOGICAL AGENTS: EXPOSURE AND RESPONSE IN
ALLERGY AND ASTHMA

FUNDING: 150 K/YR

TOTAL FUNDING FOR INSTITUTION: 550 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: UNIVERSITY OF ILLINOIS AT CHICAGO

FORM NO.U011

PRINCIPAL INVESTIGATOR: WADDEN, RICHARD A.
TITLE: EMISSION FACTORS FOR VAPOR DEGREASERS
FUNDING: 0 K/YR

END DATE: ONGOING

FORM NO.U012

PRINCIPAL INVESTIGATOR: FRANKE, JOHN E.
TITLE: SOME OBSERVATIONS OF EDDY DIFFUSIVITIES IN
INDUSTRIAL SETTINGS
FUNDING: 0 K/YR

END DATE: ONGOING

FORM NO.U013

PRINCIPAL INVESTIGATOR: FRANKE, JOHN E.
TITLE: ACTIVITY BASED EMISSION FACTORS FOR INDOOR SOURCES
FUNDING: 0 K/YR

END DATE: ONGOING

FORM NO.U014

PRINCIPAL INVESTIGATOR: SCHEFF, PETER A.
TITLE: TRACE ELEMENT ANALYSIS IN AN ELECTROPLATING AND
METAL FINISHING SHOP
FUNDING: 0 K/YR

END DATE: ONGOING

FORM NO.U015

PRINCIPAL INVESTIGATOR: SCHEFF, PETER A.
TITLE: EMISSIONS OF FREON FROM TWO OPEN TOP VAPOR
DEGREASERS
FUNDING: 0 K/YR

END DATE: ONGOING

FORM NO.U016

PRINCIPAL INVESTIGATOR: WADDEN, RICHARD A.
TITLE: INDOOR AIR POLLUTION
FUNDING: 0 K/YR

END DATE: 6/1990

FORM NO.U017

PRINCIPAL INVESTIGATOR: WADDEN, RICHARD A.
TITLE: ETHANOL EMISSIONS FROM GLAZING DURING CANDY
PRODUCTION
FUNDING: 0 K/YR

END DATE: 8/1990

FORM NO.U018

PRINCIPAL INVESTIGATOR: CONROY, LORRAINE M.
TITLE: CAPTURE EFFICIENCY OF LACAL EXHAUST HOODS
FUNDING: 15 K/YR

END DATE: 7/1991

1990 INDOOR AIR RESEARCH PROJECTS

FORM NO.U019

PRINCIPAL INVESTIGATOR: CONROY, LORRAINE M.

END DATE: 6/1990

TITLE: EFFECTS OF BUOYANT SOURCES ON CAPTURE EFFICIENCY OF
SLOT HOODS

FUNDING: 8 K/YR

FORM NO.U020

PRINCIPAL INVESTIGATOR: CONROY, LORRAINE M.

END DATE: 9/1992

TITLE: FIELD STUDY OF LOCAL EXHAUST VENTILATION
PERFORMANCE

FUNDING: 47 K/YR

TOTAL FUNDING FOR INSTITUTION: 70 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: UNIVERSITY OF NEW MEXICO SCHOOL OF MEDICINE, CANCER CENTER

FORM NO.U021

PRINCIPAL INVESTIGATOR: SAMET, JONATHAN M.

END DATE: 6/1992

TITLE: NO2 AND RESPIRATORY INFECTIONS IN INFANTS

FUNDING: 0 K/YR

TOTAL FUNDING FOR INSTITUTION: 0 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: UNIVERSITY OF PITTSBURGH

FORM NO.U022

PRINCIPAL INVESTIGATOR: ANDELMAN, JULIAN B.

END DATE: ONGOING

TITLE: INHALATION EXPOSURE IN THE HOME TO VOLATILE ORGANIC
CONSTITUENTS OF DRINKING WATER

FUNDING: 150 K/YR

TOTAL FUNDING FOR INSTITUTION: 150 K/YR

1990 INDOOR AIR RESEARCH PROJECTS

INSTITUTION: YALE UNIVESITY SCHOOL OF MEDICINE

FORM NO.U023

PRINCIPAL INVESTIGATOR: STOLWIJK, JAN A.J.

END DATE: 1/1991

TITLE: INDOOR AIR QUALITY AND PRODUCTIVITY

FUNDING: 25 K/YR

TOTAL FUNDING FOR INSTITUTION: 25 K/YR

TOTAL FUNDING FOR U: 2091 K/YR

**APPENDIX C. COST 613 FORMS RECEIVED FOR
1990 IAQ RESEARCH PROJECTS**

APPENDIX C. TABLE OF CONTENTS

<u>Institution</u>	<u>Page</u>
Environmental Protection Agency	
Air and Energy Engineering Research Laboratory	C-4
Atmospheric Research and Exposure Assessment Laboratory	C-12
Environmental Criteria and Assessment Office	C-18
Health Effects Research Laboratory	C-21
Other Federal Agencies	
National Aeronautics and Space Administration	C-24
National Institute for Occupational Safety and Health	C-25
National Institute of Standards and Technology	C-32
U.S. Department of Energy	C-35
U.S. Department of Housing and Urban Development	C-41
U.S. Department of Transportation	C-42
National Laboratories	
Argonne National Laboratory	C-43
Lawrence Berkeley Laboratory	C-44
Lawrence Livermore National Laboratory	C-57
Private Research	
Center for Indoor Air Research	C-58
Dames and Moore	C-84
Gas Research Institute	C-85
Los Amigos Research and Education Institute, Inc.	C-93
Rand Corporation	C-95
States	
California Department of Health Services	C-96
Maryland Department of the Environment	C-107
Minnesota Department of Health	C-108
New Jersey Department of Health	C-110
Texas Department of Health	C-112
Wisconsin Department of Health and Social Services	C-113
Universities	
Brigham Young University	C-114
Harvard School of Public Health	C-116

InstitutionPage

Universities (cont'd)

Rutgers University	C-118
University of Arizona College of Medicine	C-121
University of Illinois at Chicago	C-124
University of New Mexico School of Medicine, Cancer Center	C-134
University of Pittsburgh	C-135
Yale University School of Medicine	C-136

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address	
Indoor Air Branch Air and Energy Engineering Research Laboratory U.S. EPA (MD-54) Research Triangle Park, NC 27711	<div>a</div> <div>b</div>
Name of principal investigator Merrill D. Jackson, Indoor Air Branch	Telephone No. (919) - 541-2559
Descriptive project title: EVALUATION OF SOURCE MANAGEMENT OPTIONS FOR IAQ CONTROL - Test House Studies of Materials (Jackson) - Test House Studies of Activities (Jackson)	
Keywords (see attached list) Control techniques, building materials, household products, VOC (volatile organic compounds), biological (pollution), gases, particles, and field trials.	
Project start 1988	(Envisaged) project end Continuing
Estimated manpower 1.0 FTE (EPA persnnel)	Estimated cost \$200 K/yr (extramural)

Form of the COST 613 Inventory of Indoor Air Research.

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Air Branch Air and Energy Engineering Research Laboratory U.S. EPA (MD-54) Research Triangle Park, NC 27711		a
		b
Name of principal investigator Leslie E. Sparks, Indoor Air Branch	Telephone No. (919) - 541-2458	
Descriptive project title: METHODS DEVELOPMENT FOR IAQ CONTROL - IAQ Model for Comparing Exposure Reductions - Air Cleaner Testing Methods		
Keywords (see attached list) Control techniques, electrostatic filters, filter systems, biological (pollution) VOC (volatile organic compounds), gases, particles, ventilation, methods, models, and standardization.		
Project start 1987	(Envisaged) project end 1993	
Estimated manpower 1.0 FTE (EPA personnel)	Estimated cost \$250 K/yr (extramural)	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address		a
Indoor Air Branch Air and Energy Engineering Research Laboratory U.S. EPA (MD-54) Research Triangle Park, NC 27711		b:
Name of principal investigator		Telephone No.
Leslie E. Sparks, Indoor Air Branch Merrill D. Jackson, Indoor Air Branch		(919) - 541-2458 (919) - 541-2559
Descriptive project title: EVALUATION OF AIR CLEANERS FOR IAQ CONTROL		
<ul style="list-style-type: none"> - Laboratory Testing: Particle Control Devices (Sparks) - Laboratory Testing: Gaseous Control Devices (Sparks) - Test House and Field Studies of Air Cleaners (Jackson) 		
Keywords (see attached list)		
Adsorption, control techniques, electrostatic filters, filter systems, VOC (volatile organic compounds), biological (pollution), gases, particles, ventilation and field trials.		
Project start	(Envisaged) project end	
1989	Continuing	
Estimated manpower	Estimated cost	
1.5 FTE (EPA personnel)	300 K/yr (extramural)	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Indoor Air Branch Air and Energy Engineering Research Laboratory U.S. EPA (MD-54) Research Triangle Park, NC 27711		a
		b
Name of principal investigator W. Gene Tucker, Chief, Indoor Air Branch Bruce A. Tichenor, Indoor Air Branch		Telephone No. (919) - 541-2746 (919) - 541-2991
Descriptive project title: METHODS DEVELOPMENT FOR SOURCE CHARACTERIZATION - ASTM Method for Chemical Emission Rates (Tichenor) - Response - Based Testing of Emissions (Tucker) - Emissions from Biocontaminated Sources (Tichenor)		
Keywords (see attached list) Emissions, biological (pollution), VOC (volatile organic compounds), gases, particles, comfort, irritation (mucous membranes, eyes, skin), respiratory (effects), sensory effects, chamber study, methods, and standardization		
Project start 1984	(Envisaged) project end 1995	
Estimated manpower 1.5 FTE (EPA personnel)	Estimated cost \$300K/yr (extramural)	

Form of the COST 613 Inventory of Indoor Air Research.

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Air Branch Air and Energy Engineering Research Laboratory U.S. EPA (MD-54) Research Triangle Park, NC 27711	a
	b
Name of principal investigator Leslie E. Sparks, Indoor Air Branch	Telephone No. (919) - 541-2458
Descriptive project title: EVALUATION OF VENTILATION FOR IAQ CONTROL - Studies of Pollutant Sources in HVAC Systems (w/ASHRAE) - Studies of Ventilation Effectiveness (w/ASHRAE)	
Keywords (see attached list) Control techniques, biological (pollution) VOC (volatile organic compounds), gases, particles, comfort, irritation (mucuous membranes, eyes, skin), respiratory (effects), sensory effects, ventilation and field trials.	
Project start 1990	(Envisaged) project end Continuing
Estimated manpower 1.0 FTE (EPA personnel)	Estimated cost \$100 K/yr (extramural)

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Indoor Air Branch Air and Energy Engineering Research Laboratory U.S. EPA (MD-54) Research Triangle Park, NC 27711		a b
Name of principal investigator Bruce A. Tichenor, Indoor Air Branch James B. White, Indoor Air Branch	Telephone No. (919) - 541-2991 (919) - 541-1189	
Descriptive project title: SOURCE CHARACTERIZATION RESEARCH - "Sink" Effect of Indoor Surfaces (Tichenor) - Technical Support Studies (Tichenor) - Database of Indoor Air Pollutant Sources (White) - Field Studies of Combustion Sources (White)		
Keywords (see attached list) Adsorption, emissions, building materials, combustion (sources), household products, biological (pollution), VOC (volatile organic compounds), gases, particles, chamber study, data base, and field measurements.		
Project start 1985	(Envisaged) project end Continuing	
Estimated manpower 2.0 FTE (EPA personnel)	Estimated cost \$500 K/yr (extramural)	

Form of the COST 613 Inventory of Indoor Air Research.
CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Air and Energy Engineering Research Laboratory U.S. EPA MD-54 Research Triangle Park, NC 27711		a
		b
Name of principal investigator W. Gene Tucker, Chief Indoor Air Branch Combustion and Indoor Air Division		Telephone No. (919) 541-2746 (FTS) 629-2746
Descriptive project title Indoor Air Source Characterization		
Keywords (see attached list) Emission, methods, sources, pollutants, building materials, household products, combustion, biological, temperature, humidity, air infiltration, data base, model, furniture, health, occupant, organic, exposure, concentrations, chemical, risk, irritation, chamber study, animal study, odor.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower FTE 6.0	Estimated cost \$507.6K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Air and Energy Engineering Research Laboratory U.S. EPA MD-54 Research Triangle Park, NC 27711		a		
		b		
Name of principal investigator W. Gene Tucker, Chief Indoor Air Branch Combustion and Indoor Air Division	Telephone No. (919) 541-2746 (FTS) 629-2746			
Descriptive project title Indoor Air Quality Control				
Keywords (see attached list) Models, occupant, exposure, pollutants, PM, vapors, evaluation, ventilation, strategies, ACS, control techniques, emissions, combustion, outdoor air, concentrations, source, air movement, filters, gases, ozone, ETS, outdoor air, building, soil, insecticides, moisture, radon.				
Project start FY90	(Envisaged) project end ongoing			
Estimated manpower FTE 2.0	Estimated cost \$338.4K			

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Atmospheric Research and Exposure Assessment Laboratory U.S. EPA MD-80 Research Triangle Park, NC 27711		a
		b
Name of principal investigator John S. Irwin		Telephone No. (919) 541-1323 (FTS) 629-1323
Descriptive project title Develop and Validate Computer Assisted Software for Upgraded NIST Indoor Dispersion/Ventilation Model		
Keywords (see attached list) Ventilation, models, building, air movement, multizonal, ACS, pollutants, concentrations, validation, evaluation.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower FTE 0.3	Estimated cost	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Atmospheric Research and Exposure Assessment Laboratory U.S. EPA MD-77B Research Triangle Park, NC 27711		a
		b
Name of principal investigator Berne I. Bennett	Telephone No. (919) 541-2366 (FTS) 629-2366	
Descriptive project title Develop and Validate Quality Assurance Standards		
Keywords (see attached list) Pollutants, concentrations, VOCs, chemical, sampling, analysis, SVOCs, standards, review, environmental monitoring, vapors, PM, methods, validation, evaluation.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower FTE 0.2	Estimated cost \$26.5K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Atmospheric Research and Exposure Assessment Laboratory U.S. EPA MD-77 Research Triangle Park, NC 27711		a
		b
Name of principal investigator Frank McElroy, Act. Chief Ambient Methods Standardization Branch Quality Assurance Division	Telephone No. (919) 541-2622 (FTS) 629-2622	
Descriptive project title Compendium of Indoor Air Quality Methods		
Keywords (see attached list) Methods, VOCs, CO ₂ , NO _x , formaldehyde, aldehyde, PAH, insecticides, ACS, PM, biologicals, environmental monitoring, analysis, evaluation, air movement.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower FTE 0.5	Estimated cost \$42.5K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Atmospheric Research and Exposure Assessment Laboratory U.S. EPA MD-56 Research Triangle Park, NC 27711		a
		b
Name of principal investigator Ross Highsmith (Microenvironmental) James D. Mulik (PSD)	Telephone No. (919) 541-7828 (FTS) 629-7828 (919) 541-3067 (FTS) 629-3067	
Descriptive project title Monitoring Methods Development		
Keywords (see attached list) PM, VOCs, SVOCs, exposure, pollutants, chemical, analysis, sources, NO _x , humidity, temperature, ACS, formaldehyde, environmental monitoring, passive samplers, representative survey, methods, evaluation, field trials.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower FTE 0.5	Estimated cost \$55K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Atmospheric Research and Exposure Assessment Laboratory U.S. EPA MD-44 Research Triangle Park, NC 27711		a
		b
Name of principal investigator Nancy K. Wilson, Chief Analytical Methods Research Section Methods Research Branch James D. Mulik	Telephone No. (919) 541-4723 (FTS) 629-4723 (919) 541-3067 (FTS) 629-3067	
Descriptive project title Analytical Methods Development		
Keywords (see attached list) Sampling, analysis, VOCs, source, SVOCs, PAH, formaldehyde, carcinogenic, environmental monitoring.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower FTE 0.5	Estimated cost \$80K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Atmospheric Research and Exposure Assessment Laboratory U.S. EPA MD-56 Research Triangle Park, NC 27711		a
		b
Name of principal investigator Ross Highsmith	Telephone No. (919) 541-7828 (FTS) 629-7828	
Descriptive project title Large Building Studies		
Keywords (see attached list) Building, chemical, residence, offices, exposure, risk, SBS, strategies, PM, VOCs, SVOCs, environmental monitoring, analysis, sources, representative survey, validation, complaint, health, multi-zonal, employees.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower FTE 1.0	Estimated cost \$345K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Environmental Criteria and Assessment Office U.S. EPA MD-52 Research Triangle Park, NC 27711		a
		b
Name of principal investigator Michael A. Berry, Deputy Director Environmental Criteria and Assessment Office	Telephone No. (919) 541-4172 (FTS) 629-4172	
Descriptive project title Indoor Air Program Management, Coordination and Research Community Support		
Keywords (see attached list) Risk, models, buildings, health, sources, strategies, environmental monitoring, control techniques, combustion.		
Project start FY89	(Envisaged) project end ongoing	
Estimated manpower FTE 1.5	Estimated cost \$75K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Environmental Criteria and Assessment Office U.S. EPA MD-52 Research Triangle Park, NC 27711		a
		b
Name of principal investigator Michael A. Berry, Deputy Director Environmental Criteria and Assessment Office		Telephone No. (919) 541-4172 (FTS) 629-4172
Descriptive project title Risk Characterization Methodology and Risk Assessment		
Keywords (see attached list) Risk, health, pollutants, asthmatic, NO _x , biological, carcinogenic, formaldehyde, methods, ETS, combustion, emissions, general populations, home textiles.		
Project start FY89	(Envisaged) project end ongoing	
Estimated manpower FTE 1.5	Estimated cost \$155K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Environmental Criteria and Assessment Office U.S. EPA MD-52 Research Triangle Park, NC 27711		a
		b
Name of principal investigator Norman E. Childs, Act. Chief Environmental Media Assessment Branch Environmental Criteria and Assessment Office		Telephone No. (919) 541-2229 (FTS) 629-2229
Descriptive project title Publication of the Indoor Air Reference Bibliography		
Keywords (see attached list) Database.		
Project start FY89	(Envisaged) project end ongoing	
Estimated manpower FTE 0.5	Estimated cost \$15K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Health Effects Research Laboratory U.S. EPA MD-58 Research Triangle Park, NC 27711		a
		b
Name of principal investigator George M. Goldstein David A. Otto	Telephone No. (919) 966-6200 (919) 966-6226	
Descriptive project title Neurobehavioral, Respiratory and Sensory Irritant Effects of complex VOC Mixtures in Humans		
Keywords (see attached list) Exposure, VOC, SBS, employees, pollutants, health, building materials, solvents, effects, validation, susceptible groups, chemical, carcinogenic, behavioral, respiratory, sensory effects, irritation, subjective evaluation, nasal function, odors, concentrations, field trials.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower FTE 1.0	Estimated cost \$500K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Health Effects Research Laboratory U.S. EPA MD-68 Research Triangle Park, NC 27711		a
		b
Name of principal investigator Joellen Lewtas, Chief Genetic Bioassay Branch Genetic Toxicology Division George M. Goldstein		Telephone No. (919) 541-3849 (FTS) 629-3849 (919) 966-6204
Descriptive project title Biological Markers for Environmental Tobacco Smoke (ETS) Exposure and Dosimetry in Children and Adults		
Keywords (see attached list) ETS, bioassay, methods, biological monitoring, children, validation, exposure, evaluation, dose, risk, health, effects, cancer, respiratory, chemical, chamber study, field trials, daycare center, environmental monitoring, mutagenicity, concentrations, in vitro study.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower	Estimated cost \$315K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Health Effects Research Laboratory U.S. EPA MD-58 Research Triangle Park, NC 27711		a
		b
Name of principal investigator George M. Goldstein	Telephone No. (919) 966-6200	
Descriptive project title Toxicological Effects of VOC Mixtures in Animal and <u>In Vitro</u> Systems		
Keywords (see attached list) Toxicology, VOC, animal studies, in vitro study, immunotoxicity, behavioral effects, exposure, irritation, mutagenicity, building materials, furniture, comfort, health, respiratory, bioassay, cancer, chamber study.		
Project start FY90	(Envisaged) project end ongoing	
Estimated manpower	Estimated cost \$159K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Science and Technology Laboratory NASA - Stennis Space Center Stennis Space Center, MS 39529-6000		a
		b
Name of principal investigator Anne H. Johnson, Research Microbiologist Science and Technology Laboratory	Telephone No. (601) 688-3155 (FTS) 494-3155	
Descriptive project title Reduction of VOCs by foliage plants and associated microbial populations		
Keywords (see attached list) plants, soil, biological monitoring, bacteria, fungi, organics		
Project start FY 87	(Envisaged) project end Continuing	
Estimated manpower	Estimated cost	

Form of the COST 613 Inventory of Indoor Air Research.
CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Division of Biomedical and Behavioral Sciences National Institute for Occupational Safety and Health 4676 Columbia Parkway Cincinnati, Ohio 45226		a
		b
Name of principal investigator Joseph J. Hurrell, Jr. Applied Psychology and Ergonomics Branch	Telephone No. (513) 533-8293 FTS 684-8293	
Descriptive project title Development of Survey Assessment Instrument for IAQ		
Keywords (see attached list) reactions, buildings (office), employees, measurement methods		
Project start FY 89	(Envisaged) project end FY 91	
Estimated manpower 0.7 FTE	Estimated cost \$50K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Division of Training and Manpower Development National Institute for Occupational Safety and Health 4676 Columbia Parkway Cincinnati, Ohio 45226		a
		b
Name of principal investigator Pete Rentos, Ph.D. Educational Resource Development Branch		Telephone No. (513) 533-8251 FTS 684-8251
Descriptive project title Educational Modules for Transferring Research Results		
Keywords (see attached list) control techniques, guidelines, building materials, formaldehyde, biological, offices, new buildings, employees, health, SBS, ventilation, assessment, outdoor, asbestos, radon, sampling		
Project start FY 89	(Envisaged) project end Ongoing	
Estimated manpower FTE 1.0	Estimated cost \$70K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Division of Surveillance, Hazard Evaluations and Field Studies National Institute for Occupational Safety and Health 4676 Columbia Parkway Cincinnati, Ohio 45226		a
		b
Name of principal investigator David Sundin Hazard Evaluations and Technical Assistance Branch		Telephone No. (513) 841-4382 FTS 684-4382
Descriptive project title Health Hazard Evaluations on Indoor Air Quality		
Keywords (see attached list) buildings (office), comfort, CO ₂ , formaldehyde, health, schools, VOC		
Project start Continuous	(Envisaged) project end Ongoing	
Estimated manpower FTE 6.0 per year	Estimated cost \$150K per year	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Division of Surveillance, Hazard Evaluations and Field Studies National Institute for Occupational Safety and Health 4676 Columbia Parkway Cincinnati, Ohio 45226		a
		b
Name of principal investigator Michael Crandall Anne Fidler, Ph.D. Hazard Evaluations and Technical Assistance Branch		Telephone No. (513) 841-4382 FTS 684-4382
Descriptive project title Library of Congress Indoor Air Quality Study		
Keywords (see attached list) biological, building (library), comfort, CO ₂ , exposure, health, psycho-social, spatial variations, VOC		
Project start FY 89	(Envisaged) project end FY 90	
Estimated manpower 1.2 FTE	Estimated cost \$120K	

Form of the COST 613 Inventory of Indoor Air Research.
CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Division of Surveillance, Hazard Evaluations and Field Studies National Institute for Occupational Safety and Health 4676 Columbia Parkway Cincinnati, Ohio 45226		a
		b
Name of principal investigator Gret A. Burkhart, M.D., M.S. Industrywide Studies Branch Epidemiology I Section		Telephone No.
Descriptive project title Feasibility of Conducting Epidemiologic Studies of Building Related Illness		
Keywords (see attached list) epidemiologic study, exposure, health, non-residential buildings, occupants, outdoor air, representative survey, review, risk analysis, SBS		
Project start FY 90	(Envisaged) project end Ongoing	
Estimated manpower FTE 0.25 per year	Estimated cost \$10K per year	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address DIVISION OF PHYSICAL SCIENCES AND ENGINEERING NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH 4676 COLUMBIA PARKWAY CINCINNATI, OHIO 45226		a
		b
Name of principal investigator EUGENE KENNEDY, PH.D. ORGANIC METHODS DEVELOPMENT SECTION METHODS RESEARCH BRANCH		Telephone No. (513) 841-4402 FTS 684-4402
Descriptive project title METHOD FOR SAMPLING AND ANALYSIS OF INDOOR AIR FOR ORGANIC COMPOUNDS		
Keywords (see attached list) ANALYSIS, DETECTION, DETECTION METHODS, ENVIRONMENTAL MONITORING, EXPOSURE, NEW BUILDINGS, OFFICES, MEASUREMENT, MEASUREMENT METHODS, METHODS, POLLUTANTS, SAMPLING, TLV, VOC		
Project start FY 89	(Envisaged) project end FY 92	
Estimated manpower FTE 4.0	Estimated cost \$50,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address DIVISION OF PHYSICAL SCIENCES AND ENGINEERING NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH 4676 COLUMBIA PARKWAY CINCINNATI, OHIO 45226		a
		b
Name of principal investigator MAZEN ANASTAS CONTROL RESEARCH SECTION MONITORING AND CONTROL RESEARCH BRANCH		Telephone No. (513) 841-4319 FTS 684-4319
Descriptive project title METHODS FOR EVALUATING INDOOR AIR VENTILATION SYSTEMS		
Keywords (see attached list) ACS, AIR INFILTRATION, AIR MOVEMENT, CLIMATE, CONTROL, CONTROL TECHNIQUES, FORCED VENTILATION, NEW BUILDINGS, OFFICES, TEMPERATURE, VENTILATION		
Project start FY 89	(Envisaged) project end FY 91	
Estimated manpower FTE 4.0	Estimated cost \$60,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address National Institute of Standards and Technology Center for Building Technology Building Environment Division Building 226, Room A313 Gaithersburg, Maryland 20899		a
		b
Name of principal investigator Andrew K. Persily, Ph.D.	Telephone No. (301) 975-6418	
Descriptive project title Efficiency of Gaseous Contaminant Removal Devices		
Keywords (see attached list) control techniques, standards, filter systems, gases, measurement methods,		
Project start FY 87	(Envisaged) project end FY 90	
Estimated manpower FTE 0.75	Estimated cost \$100K	

Form of the COST 613 Inventory of Indoor Air Research.
CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address National Institute of Standards and Technology Center for Building Technology Building Environment Division Building 226, Room A313 Gaithersburg, Maryland 20899		a
		b
Name of principal investigator Andrew K. Persily, Ph.D.	Telephone No. (301) 975-6418	
Descriptive project title Infiltration and Ventilation in Large Buildings		
Keywords (see attached list) outdoor air, offices, air conditioning systems, air infiltration, forced ventilation, ventilation, natural ventilation, field measurements, environmental monitoring, investigations, measurement methods, multizonal		
Project start FY 84	(Envisaged) project end ongoing	
Estimated manpower FTE 1.5	Estimated cost \$175K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address National Institute of Standards and Technology Center for Building Technology Building Environment Division Building 226, Room A313 Gaithersburg, MD 20899		a
		b
Name of principal investigator Andrew K. Persily, Ph.D.	Telephone No. (301) 975-6418	
Descriptive project title Indoor Air Pollution Concentration Model		
Keywords (see attached list) models validation		
Project start FY 86	(Envisaged) project end ongoing	
Estimated manpower FTE 1.0	Estimated cost \$125K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Bonneville Power Administration U.S. Department of Energy P.O. Box 3621 Portland, OR 97208-3621		a
		b
Name of principal investigator Mark Jackson -- RMRD	Telephone No. (503) 230-3098 FTS 429-3098	
Descriptive project title Residential Ventilation Research Project (Multifaceted cooperative project with Electric Power Research Institute and various ventilation equipment manufacturers) (See attached two-page summary.)		
Keywords (see attached list) Ventilation, buildings--residential		
Project start 1989	(Envisaged) project end 1993	
Estimated manpower BPA--0.25 FTE/yr. Others--??	Estimated cost BPA--\$336K Others--\$400K } 736K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Bonneville Power Administration U.S. Department of Energy P.O. Box 3621 Portland, OR 97208-3621		a
		b
Name of principal investigator Mark Jackson -- RMRD		Telephone No. (503) 230-3098 FTS 429-3098
Descriptive project title Single Family Ventilation Case Studies (See attached 1-page project.)		
Keywords (see attached list) Ventilation, buildings--single family residential		
Project start 1990	(Envisaged) project end 1992	
Estimated manpower BPA--0.20 FTE/yr.	Estimated cost \$160K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Bonneville Power Administration U.S. Department of Energy P.O. Box 3621 Portland, OR 97208-3621		a
		b
Name of principal investigator Mark Jackson -- RMRD	Telephone No. (503) 230-3098 FTS 429-3098	
Descriptive project title Super Good Cents Multifamily Ventilation (Field test six different innovative ventilation systems in new energy efficient multifamily housing projects) (See attached brochure.)		
Keywords (see attached list) Ventilation, buildings--multifamily		
Project start 1990	(Envisaged) project end 1992	
Estimated manpower BPA--0.20 FTE/yr. Others--??	Estimated cost \$340K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Bonneville Power Administration P.O. Box 3621 Portland, OR 97206-3621		a
		b
Name of principal investigator Tim Steele		Telephone No. 503 230-3303 FTS 429-3303
Descriptive project title Adoption and Interpretation of ASHRAE Standard 62-1989 (See attached description.)		
Keywords (see attached list) Ventilation, standards		
Project start January 1990	(Envisaged) project end June 1990	
Estimated manpower 0.25 FTE	Estimated cost staff cost only	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Bonneville Power Administration P.O. Box 3621 Portland, OR 97208-3621		a
		b
Name of principal investigator Charles Eastwood -- RMRD		Telephone No. 503 230-4992 FTS 429-4992
Descriptive project title Development of an Expert System for Residential Radon Mitigation (See attached description.)		
Keywords (see attached list) Radon, Expert System, Artificial Intelligence, Mitigation		
Project start 6-90	(Envisaged) project end 6-91	
Estimated manpower 2.5	Estimated cost \$72,000	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Bonneville Power Administration P.O. Box 3621 Portland, OR 97208-3621		a
		b
Name of principal investigator Charles Eastwood -- RMRD		Telephone No. 503 230-4992 FTS 429-4992
Descriptive project title Influence of Subslab Aggregate Permeability on the Performance of Radon Subslab Ventilation Mitigation Systems (See attached description.)		
Keywords (see attached list) Aggregate, Gravel, Subslab Ventilation, Radon, Mitigation		
Project start 5/90	(Envisaged) project end 3/91	
Estimated manpower 2.0	Estimated cost \$70,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address U.S. Department of Housing and Urban Development Office of Policy Development and Research 451 7th Street, SW Washington, DC 20410		a
		b
Name of principal investigator Conrad C. Arnolts (HUD) - Michael Boyd (EPA)		Telephone No. (202) 755-5528-(202) 382-4353
Descriptive project title Radon Testing and Evaluation in Multistory Residential Buildings		
Keywords (see attached list) Spatial variations, concentrations, radon, residential buildings, occupants, field requirements		
Project start April, 1990	(Envisaged) project end December, 1990	
Estimated manpower	Estimated cost &70,000	

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Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address U.S. Department of Transportation (Office of the Secretary, P-15) Washington, D.C. 20590 (Arnold G. Konheim)		a
		b
Name of principal investigator Dr. Niren NAGDA, Geomet Technologies, Inc.		Telephone No. 301-428-9898
Descriptive project title Airliner Cabin environment: Contaminant Measures, Health Risks, and Mitigation options.		
Keywords (see attached list) Aerosols, bacteria, biological (pollution), CO ₂ , ETS (Environmental Tobacco Smoke), fungi, odors, ozone, radioactivity, cancer, irritation (mucous membranes, eyes, skin), mutagenicity, ACS (Air Conditioning System), humidity, ventilation, data base, detection methods, models, passive samplers, sampling, dose.		
Project start		(Envisaged) project end
Estimated manpower		Estimated cost

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Argonne National Laboratory 9700 South Cass Avenue Argonne, IL 60439		a
		b
Name of principal investigator Robert A. Schlenker and Richard E. Toohey Environment, Safety, and Health Department Marvin Wesely, Environmental Research Division		Telephone No. 708-972-4180 (FTS) 972-4180
Descriptive project title Assessment of Thoron and Thoron Daughter Products		
Keywords (see attached list) Thoron, radon, seasonal variations, concentrations, sources, residences, climate, meteorological factors, temperature, humidity, ventilation, environmental monitoring, models		
Project start FY88		(Envisaged) project end Ongoing
Estimated manpower FTE 1.5		Estimated cost \$188K

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Anthony V. Nero Joan M. Daisey		Telephone No. (415) 486-7491 FTS: 451-7491 FAX: (415) 486-6658
Descriptive project title Air Pollutant Exposures in Buildings		
Keywords (see attached list) population exposures, data analyses and integration, models, buildings, radon, volatile organic compounds, ETS, PAH, CO, PM, pollutants, NO ₂ , SO ₂		
Project start FY 1976	(Envisaged) project end Ongoing	
Estimated manpower 1.3 FTE	Estimated cost \$200 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Joan M. Daisey	Telephone No. (415) 486-7491 FTS 451-7491 FAX: (415) 486-6658	
Descriptive project title Infiltration, Ventilation and Indoor Air Quality		
Keywords (see attached list) air infiltration, air movement, forced ventilation, natural ventilation, ventilation, buildings and energy usage, new buildings, offices, residences, schools, passive samplers, aerosols, aldehydes, CO (carbon monoxide), ETS, formaldehyde, N-PAH, organic chemical, PAH, pollution, pollutants, POM, solvents, SVOC, VOC, control techniques, exposure, emissions, energy conservation, seasonal and spatial variations, guidelines, reactions, SBS		
Project start FY 77	(Envisaged) project end Ongoing	
Estimated manpower	Estimated cost 872 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Joan M. Daisey		Telephone No. (415) 486-7491 FTS 451-7491 FAX (415) 486-6658
Descriptive project title Indoor Atmospheric Chemistry: Interactions of Radon with Other Gaseous Pollutants		
Keywords (see attached list) chemical reactions, radon, VOC, organic compounds, PAH, radiolysis, particulate matter		
Project start FY 88	(Envisaged) project end Open	
Estimated manpower 1.1 FTE	Estimated cost 162 K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Joan M. Daisey	Telephone No. (415) 486-7491 FTS: 451-7491 FAX: (415) 486-6658	
Descriptive project title Mechanism-based Risk Assessment for Indoor Air Exposures		
Keywords (see attached list) biological monitoring, bioassay, development, models, pharmacokinetics, cancer, exposure, risk estimate, VOC		
Project start FY '90	(Envisaged) project end Ongoing	
Estimated manpower	Estimated cost 50 K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Max H. Sherman		Telephone No. (415) 486-4022 FTS: 451-4022 FAX: (415) 486-6658
Descriptive project title Ventilation Measurement Techniques		
Keywords (see attached list) air infiltration, ventilation, field measurements, measurement methods, multizonal, development, concentrations		
Project start FY '86	(Envisaged) project end Ongoing	
Estimated manpower 1 FTE	Estimated cost \$150 K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Mark P. Modera		Telephone No. (415) 486-4678 FTS: 451-4678 FAX: (415) 486-6658
Descriptive project title Air Leakage in Buildings		
Keywords (see attached list) energy conservation, seasonal variations, standards, air infiltration, field measurements		
Project start FY '80	(Envisaged) project end Ongoing	
Estimated manpower 1 FTE	Estimated cost \$150 K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Helmut E. Feutzel	Telephone No. (415)486-4021 FTS: 451-4021 FAX: (415)486-6658	
Descriptive project title Air Flow Modelling		
Keywords (see attached list) ventilation, multizonal, air movement, modelling, validation, development control techniques		
Project start FY '85	(Envisaged) project end Ongoing	
Estimated manpower 1 FTE	Estimated cost \$100 K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Gregory W. Traynor		Telephone No. (415) 486-5729 FTS: 451-5729 FAX: (415) 486-6658
Descriptive project title Development of a Carbon Monoxide Passive Sampler		
Keywords (see attached list) CO, concentrations, detection methods, development, measurement methods, outdoor air, passive samplers		
Project start FY '90	(Envisaged) project end FY '92	
Estimated manpower 0.75 FTE	Estimated cost \$90 k/year	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Gregory W. Traynor		Telephone No. (415) 486-5729 FTS: 451-5729 FAX: (415)486-6658
Descriptive project title Concentrations of Indoor Pollutants (CIP) Data Base		
Keywords (see attached list) buildings, concentrations, data base, field measurements, pollutants, review		
Project start FY '87	(Envisaged) project end FY '91	
Estimated manpower 0.25 FTE	Estimated cost \$40 K/year	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, Ca 94720		a
Name of principal investigator Gregory W. Traynor	Telephone No. (415) 486-5729 FTS: 451-5729 FAX: (415) 486-6658	
Descriptive project title Simulation Modeling of Indoor Air Pollutant Concentrations (also called "Macromodel")		
Keywords (see attached list) annual exposure, assessment, buildings, CO, control, combustion sources, concentrations, control strategies, emissions, energy conservation, exposure, indoor/outdoor ratios, modeled approach, models, NO _x , outdoor air, PAH, PM, pollutants, POM, Rn, seasonal variations, sources, SO ₂ , SVOC, variations (of concentrations/exposures), VOC		
Project start FY '87	(Envisaged) project end FY '97	
Estimated manpower 1.75 FTE	Estimated cost \$200 K/year	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator Joan M. Daisey Alfred T. Hodgson	Telephone No. (415) 486-7491 FTS: 451-7491 FAX: (415) 486-6658	
Descriptive project title Assessments of Exposures to Candidate Volatile Organic Contaminants in Indoor Air		
Keywords (see attached list) aldehydes, chlorinated hydrocarbons, halogenated hydrocarbons, N-nitrosamines, phenols, solvents, volatile organic compounds		
Project start FY '90	(Envisaged) project end FY '91	
Estimated manpower 0.25	Estimated cost \$40 K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 94720		a
		b
Name of principal investigator R. G. Sextro W. J. Fisk H. A. Wollenberg, T. N. Narisimhan		Telephone No. (415) 486-6591 FTS: 451-6591 FAX: (415) 486-6658
Descriptive project title Experimental and Theoretical Investigations of Radon Availability, Transport, and Entry		
Keywords (see attached list) analysis, assessment, field measurements, measurement methods, models, modeled approach, validation, residences, cancer, radon, exposure, seasonal variations, sources, soil, soil characteristics		
Project start 2/1/88	(Envisaged) project end open	
Estimated manpower 4.3 FTE	Estimated cost \$500 K	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Indoor Environment Program Applied Science Division Lawrence Berkeley Laboratory Berkeley, CA 97420		a
		b
Name of principal investigator A. V. Nero	Telephone No. (415)486-6591 FTS: 451-6591 FAX: (415)486-6658	
Descriptive project title Characterization of Airborne Radon Concentrations		
Keywords (see attached list) analysis, assessment, detection methods, environmental monitors, field measurements, interlaboratory comparison, modeled approach, buildings, cancer, risk estimate, radon, particulate matter, exposure, control techniques, seasonal variations, building materials, drinking water, soil, soil characteristics		
Project start 10/1/80	(Envisaged) project end open	
Estimated manpower 4.0 FTE	Estimated cost \$414 K	

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CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Environmental Sciences Division Lawrence Livermore National Laboratory P.O. Box 5507, L-453 Livermore, CA 94550		a
		b
Name of principal investigator Thomas E. McKone		Telephone No. (415) 422-7535
Descriptive project title Evaluation of Residential Exposure to Organic Chemicals in Tap Water and Soil		
Keywords (see attached list) Exposures, concentrations, variations, sources, drinking water, soil, residences, risk, humidity, temperature, ventilation, measurement, models, validation, chlorinated HC, VOC, food contamination, home dust.		
Project start FY 90	(Envisaged) project end ongoing	
Estimated manpower 2.0	Estimated cost \$200,000	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Dr. S. M. Greenfield, Dr. Gerald Anderson San Rafael California - Systems Applications		Telephone No. 415-472-4011
Descriptive project title DEVELOPING ENCHANCED INDOOR AIR QUALITY MODELS		
Keywords (see attached list) 		
Project start 4-90	(Envisaged) project end 8-90	
Estimated manpower 2.0 FTE	Estimated cost \$35,000	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Rebecca Bascom, MD University of Maryland School of Medicine		Telephone No. 301-235-1613
Descriptive project title ETS: Nasal Response and Aerosol Deposition Effect		
Keywords (see attached list) ETS, Upper Respiratory Tract, Aerosal Deposition		
Project start 10-90	(Envisaged) project end 1-94	
Estimated manpower 1.5 FTE	Estimated cost \$401,000	

**CONCERTED ACTION: "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Janet Arey, Ph.D. University of California at Davis	Telephone No. 714-787-5124	
Descriptive project title INDOOR FATE AND TRANSFORMATION OF SELECTED NITROGENOUS ORGANIC COMPOUNDS		
Keywords (see attached list) Nitrogenous Organics, Gas-Phase Transformations, Indoor Lifetimes		
Project start 2-90	(Envisaged) project end 5-91	
Estimated manpower 1.15 FTE	Estimated cost \$240,000	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Dr. Jerry K. Davis, Ph.D. University of Alabama at Birmingham	Telephone No. 205-934-2117	
Descriptive project title EFFECTS OF ETS AND NO ₂ ON RESPIRATORY INFECTION: MURINE MODEL DEVELOPMENT		
Keywords (see attached list) ETS, NO ₂ , Animal Models		
Project start 2-90	(Envisaged) project end 3-93	
Estimated manpower 2.35 FTE	Estimated cost \$453,000	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Delbert J. Eatough, Ph.D. Brigham Young University		Telephone No. 801-378-6040
Descriptive project title Mutagenicity of Gas and Particulate Phase Compounds in ETS: Development of an SFE/SFC-Bioassay Analytical Technique		
Keywords (see attached list) 		
Project start 9-90	(Envisaged) project end 1-92	
Estimated manpower 2.7 FTE	Estimated cost \$150,000	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Dr. Albert T. Gunnison NYU Medical Center		Telephone No. 914-351-4235
Descriptive project title EFFECTS OF O ₃ , NO ₂ , AND ETS ON PULMONARY FUNCTION AND EICOSANOID METABOLISM		
Keywords (see attached list) Ozone, Eicosanoid, Lung Function		
Project start 1-90	(Envisaged) project end 12-92	
Estimated manpower 2.75 FTE	Estimated cost \$568,457	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Nancy J. Haley, Ph.D. American Health Foundation		Telephone No. 914-592-2600 EXT. 314
Descriptive project title Determination of Nicotine Metabolites by Immunochemical Methods		
Keywords (see attached list) ETS, Passive, Biomonitoring		
Project start 7-90	(Envisaged) project end 6-93	
Estimated manpower 2.75 FTE	Estimated cost \$286,672	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Dr. Marvin A. Kastenbaum - Bayse, Virginia Dr. K. O. Bowman - Oak Ridge National Laboratory		Telephone No.
Descriptive project title EFFICIENT LABORATORY EXPERIMENTS FOR TESTING MUTAGENICITY OF COMPONENTS OF INDOOR AMBIENT AIR		
Keywords (see attached list)		
Project start 1-90	(Envisaged) project end 3-93	
Estimated manpower 2.0 FTE	Estimated cost \$207,900	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Steven R. Kleeberger, Ph.D. Johns Hopkins University		Telephone No. 301-955-3515
Descriptive project title Susceptibility to Ozone-Induced Airway Inflammation		
Keywords (see attached list) Ozone, Susceptibility, Genetics		
Project start 7-90	(Envisaged) project end 6-93	
Estimated manpower 1.85 FTE	Estimated cost \$455,213	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Jerold A. Last, Ph.D. University of California at Davis	Telephone No. 916-752-6230	
Descriptive project title Toxicological Interactions between the Indoor Air Pollutant NO ₂ & O ₃		
Keywords (see attached list) Fibrosis (lung), Collagen (lung), Synergistic Interactions		
Project start 1-90	(Envisaged) project end 12-92	
Estimated manpower 1.5 FTE	Estimated cost \$594,423	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Jackson O. Lay, Jr., Ph.D. University of Arkansas at Little Rock	Telephone No. 501-544-4364	
Descriptive project title Development of Fast Atom Bombardment Mass Spectral Techniques for the Identification of Unknown Carcinogen-Nucleoside Adducts		
Keywords (see attached list) Fast Atom Bombardment, Mass Spectrometry, Carcinogen-Nucleoside		
Project start 1-90	(Envisaged) project end 12-91	
Estimated manpower 1.5 FTE	Estimated cost \$132,678	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Samuel B. Lehrer, Ph.D. Tulane University Medical Center		Telephone No.
Descriptive project title PULMONARY EFFECTS OF ENVIRONMENTAL SMOKE EXPOSURE ON ASTHMATIC SUBJECTS		
Keywords (see attached list)		
Project start 9-88	(Envisaged) project end 12-92	
Estimated manpower	Estimated cost \$1,300,000	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator George D. Leikauf, Ph.D. University of Cincinnati	Telephone No. 513-558-0035	
Descriptive project title Indoor Aldehydes and Bronchial Hyperractivity		
Keywords (see attached list) Formaldehyde, Airway Epithelium, Asthma		
Project start 1-90	(Envisaged) project end 12-92	
Estimated manpower 3.5 FTE	Estimated cost \$526,996	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Robert R. Mercer, Ph.D. Duke University Medical Center	Telephone No. 919-684-2341	
Descriptive project title INJURY IN GAS EXCHANGE UNITS DUE TO LOW LEVEL NITROGEN DIOXIDE		
Keywords (see attached list) Dosimetry, Morphometry, Nitrogen Dioxide		
Project start 7-90	(Envisaged) project end 6-93	
Estimated manpower 3.8 FTE	Estimated cost \$499,587	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Mary Kay O'Rourke, Ph.D. University of Arizona College of Medicine	Telephone No. 602-626-6379	
Descriptive project title Indoor Biological Agents: Exposures and Responses in Allergy and Asthma		
Keywords (see attached list) Aeroallergens, Allergy, Asthma		
Project start 1-90	(Envisaged) project end 12-92	
Estimated manpower 2.25 FTE	Estimated cost \$457,087	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Arthur Penn, Ph.D. NYU Medical Center	Telephone No. 914-351-5126	
Descriptive project title Does ETS Promote Arteriosclerosis or Act as a Co-Atherogen		
Keywords (see attached list) Arteriosclerosis, promotion, co-atherogen		
Project start 1-90	(Envisaged) project end 12-92	
Estimated manpower 1.85 FTE	Estimated cost \$506,082	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Kent E. Pinkerton. Ph.D. University of California at Davis	Telephone No. 916-752-8334	
Descriptive project title Effects of ETS on Prenatal and Perinatal Lung Development		
Keywords (see attached list) ETS, lung development, rats		
Project start 1-90	(Envisaged) project end 12-92	
Estimated manpower 1.85 FTE	Estimated cost \$536,659	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Edward M. Postlethwait, Ph.D. University of Texas Medical Branch		Telephone No. 409-761-3120
Descriptive project title PULMONARY REACTIVE UPTAKE OF INHALED TOXIC CONTAMINANTS		
Keywords (see attached list) Pulmonary, Reactive Uptake, Oxidants		
Project start 7-90	(Envisaged) project end 6-93	
Estimated manpower 1.5 FTE	Estimated cost \$365,788	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator J.N. Pritchard, Ph.D. Harwell Laboratories, England	Telephone No. 011-44-235-434331	
Descriptive project title The Regional Deposition of ETS and its Influence on Radon Dosimetry		
Keywords (see attached list) ETS, Deposition, Radon		
Project start 7-90	(Envisaged) project end 3-93	
Estimated manpower .78 FTE	Estimated cost \$239,200	

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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator J.N. Pritchard, Ph.D. Harwell Laboratories, England	Telephone No. 011-44-235-434331	
Descriptive project title The Fate of Nicotine During "Aging" of Environmental Tobacco Smoke		
Keywords (see attached list) ETS, Nicotine Behavior		
Project start 5-90	(Envisaged) project end 4-91	
Estimated manpower .51 FTE	Estimated cost \$120,100	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator P. Barry Ryan, Ph.D. Harvard University		Telephone No. 617-432-1167
Descriptive project title INVESTIGATIONS OF OZONE CHEMISTRY IN INDOOR ENVIRONMENTS		
Keywords (see attached list) Modeling, Indoor Air Quality, Chemistry		
Project start 7-90	(Envisaged) project end 6-93	
Estimated manpower 1.75 FTE	Estimated cost \$328,205	

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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Ragnar Rylander, M.D. University of Gothenburg, Sweden		Telephone No. 031-853601
Descriptive project title Inflammatory Responses after Indoor Exposure to Airborne Glucan and Endotoxin		
Keywords (see attached list) 		
Project start 7-90	(Envisaged) project end 6-91	
Estimated manpower 	Estimated cost \$102,756	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Richard J. Shaughnessy, Ph.D. University of Tulsa	Telephone No. 918-749-4358	
Descriptive project title EVALUATION OF EFFECTIVENESS OF PORTABLE INDOOR AIR CLEANING SYSTEMS		
Keywords (see attached list). 		
Project start 9-90	(Envisaged) project end 8-92	
Estimated manpower 1.55 FTE	Estimated cost \$214,505	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Jerome J. Solomon, Ph.D. NYU Medical Center		Telephone No. 914-351-4398
Descriptive project title GENOTOXICITY OF EPOXIDE INDUCED 3-HYDORXYALKYL URACIL		
Keywords (see attached list) 3-Hydroxyalkyl Uracil, DNA adducts, Mutagenesis		
Project start 7-90	(Envisaged) project end 6-93	
Estimated manpower 3.4 FTE	Estimated cost \$727,853	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Klaus Willeke, Ph.D. University of Cincinnati		Telephone No. 513-558-0506
Descriptive project title New Bioaerosol Sampling Techniques for Indoor Air Environments		
Keywords (see attached list) Bioaerosal, Aerosal Sampling, Microorganism		
Project start 7-90	(Envisaged) project end 6-93	
Estimated manpower 2.4 FTE	Estimated cost \$502,143	

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Institute, address Center For Indoor Air Research 1099 Winterson Road, Suite 280 Linthicum, Maryland 21090 (301) 684-3777 FAX (301) 684-3729		a
		b
Name of principal investigator Dr. Hanspeter Witschi University of California at Davis	Telephone No. 916-752-0915	
Descriptive project title NEUROENDOCRINE LUNG CANCER: MECHANISTIC STUDIES		
Keywords (see attached list) Cancer (lung), neuroendocrine cells, tumor promotion		
Project start 9-90	(Envisaged) project end 8-93	
Estimated manpower 3.1 FTE	Estimated cost \$514,458	

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Dames & Moore 1550 Northwest Highway Park Ridge, Illinois 60068		a
		b
Name of principal investigator Denny Totzke Reserach Chemist		Telephone No. (708) 297-6120 FAX 297-6865
Descriptive project title Humidity/Air Exchange Study in Mobile Homes		
Keywords (see attached list) Moisture, temperature, humidity, air infiltration, air & air heating systems, modeling, moisture damage		
Project start FY '89	(Envisaged) project end ongoing	
Estimated manpower	Estimated cost \$50K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Gas Research Institute 8600 W. Bryn Mawr Avenue Chicago, IL 60631		a
		b
Name of principal investigator N. Nagda		Telephone No. 301/424-9898
Descriptive project title Quantification of Factors Affecting Indoor Air Quality		
Keywords (see attached list) Control (Strategies) Control Concentrations		
Project start 4/1/84	(Envisaged) project end 10/31/90	
Estimated manpower	Estimated cost \$2,224,221.00	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Gas Research Institute 8600 W. Bryn Mawr Avenue Chicago, IL 60631		a
		b
Name of principal investigator Stanton Coerr, Consultant		Telephone No. 919/967-0750
Descriptive project title Regulatory Evaluation of Indoor Air Quality Issues and Technology Transfer		
Keywords (see attached list) Analysis Assessment Evaluation Review		
Project start 11/86	(Envisaged) project end 3/91	
Estimated manpower	Estimated cost \$477,430	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Gas Research Institute 8600 W. Bryn Mawr Avenue Chicago, IL 60631		a
		b
Name of principal investigator T. Grumbly		Telephone No. 617/491-2926
Descriptive project title Nitrogen Dioxide Exposure and Susceptibility to Respiratory Infections		
Keywords (see attached list) Nitrogen Dioxide Exposure Analysis Assessment Evaluation Measurement Respiratory Effect		
Project start 7/1/87	(Envisaged) project end 6/30/92	
Estimated manpower	Estimated cost \$1,187,632	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Gas Research Institute 8600 W. Bryn Mawr Avenue Chicagok IL 60631		a
		b
Name of principal investigator J. Reuther		Telephone No. 614/424-4916
Descriptive project title Evaluation of NO ₂ Protocol and Burner Emissions		
Keywords (see attached list) Measurement methods Gas Cookers Evaluation Nitrogen Oxides Analysis Interlaboratory Comparison		
Project start 9/1/88	(Envisaged) project end 4/90	
Estimated manpower	Estimated cost \$222,300	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Gas Research Institute 8600 W. Bryn Mawr Avenue Chicago, IL 60631		a		
		b		
Name of principal investigator N. Leslie		Telephone No. 708/647-9000		
Descriptive project title Conventional Energy Research House				
Keywords (see attached list) <table border="0"> <tr> <td>NO. Dwellings-Residences Analysis Assessment</td> <td>Field Measurements Multizonal Combustion Sources</td> </tr> </table>			NO. Dwellings-Residences Analysis Assessment	Field Measurements Multizonal Combustion Sources
NO. Dwellings-Residences Analysis Assessment	Field Measurements Multizonal Combustion Sources			
Project start 9/2/86	(Envisaged) project end 7/31/92			
Estimated manpower	Estimated cost \$1,521,637			

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Gas Research Institute 8600 W. Bryn Mawr Avenue Chicago, IL 60631		a										
		b										
Name of principal investigator J. D. Spengler		Telephone No. 617/732-1255										
Descriptive project title Assessment of Public Total Exposure to Selected Emissions Species Contributed in Part by Indoor Sources												
Keywords (see attached list) <table border="0"> <tr> <td>Gas Cookers</td> <td>Analysis</td> </tr> <tr> <td>Emissions</td> <td>Assessment</td> </tr> <tr> <td>NO</td> <td>Evaluation</td> </tr> <tr> <td>Residence^x</td> <td>Environmental Monitoring</td> </tr> <tr> <td>Effects</td> <td></td> </tr> </table>			Gas Cookers	Analysis	Emissions	Assessment	NO	Evaluation	Residence ^x	Environmental Monitoring	Effects	
Gas Cookers	Analysis											
Emissions	Assessment											
NO	Evaluation											
Residence ^x	Environmental Monitoring											
Effects												
Project start 7/1/83	(Envisaged) project end 5/31/90											
Estimated manpower	Estimated cost \$2,788,500											

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Gas Research Institute 8600 W. Bryn Mawr Avenue Chicago, IL 60631		a
		b
Name of principal investigator C. W. Spicer		Telephone No. 614/424-5263
Descriptive project title Investigation of Nitrogen Dioxide Removal from Indoor Air		
Keywords (see attached list) Reactive, reactions, NO _y Control Strategies Surfaces Variations of Concentrations Evaluation		
Project start 8/1/86	(Envisaged) project end 3/1/91	
Estimated manpower	Estimated cost \$444,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Gas Research Institute 8600 W. Bryn Mawr Avenue Chicago, IL 60631		a
		b
Name of principal investigator D. Walkinshaw	Telephone No. 613/748-2714	
Descriptive project title Partial Funding for 5th International Conference on Indoor Air Quality		
Keywords (see attached list) Review		
Project start 9/30/89	(Envisaged) project end 9/30/90	
Estimated manpower	Estimated cost \$25,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Environmental Health Service Los Amigos Research & Education Institute, Inc. 51 Medical Science Bldg. 7601 Imperial Highway Downey, California 90242		a
		b
Name of principal investigator Jack D. Hackney, M.D.		Telephone No. (213) 940-7561
Descriptive project title Field studies of respiratory health status and irritant exposures in asthmatic volunteers		
Keywords (see attached list) exposure, seasonal variations, outdoor air, asthma, health, lung function, risk assessment, risk groups, field measurements,		
Project start 1988	(Envisaged) project end 1992	
Estimated manpower 2 FTE	Estimated cost \$300,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Environmental Health Service Los Amigos Research & Education Institute, Inc. 51 Medical Science Building 7601 Imperial Highway Downey, California 90242		a
		b
Name of principal investigator Jack D. Hackney, M.D.		Telephone No. (213) 940-7561
Descriptive project title Effects of NO ₂ in volunteers with chronic obstructive pulmonary disease-- a combined field monitoring and chamber exposure study		
Keywords (see attached list) exposure, outdoor air, NO ₂ , health, lung function, risk assessment, risk groups, controlled exposure, field measurements, passive samplers		
Project start 1989	(Envisaged) project end 1990	
Estimated manpower 3 FTE	Estimated cost \$180,000	

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Rand Corporation 1700 Main Street Santa Monica, CA 90401 U.S.A.		a
		b
Name of principal investigator Naihua Duan		Telephone No. (213) 393-0411 x. 7896
Descriptive project title Study on statistics and environmental factors in health		
Keywords (see attached list) exposure, variations of concentrations/exposures, environmental monitoring, epidemiology, models, sampling, validation		
Project start September 1985	(Envisaged) project end April 1991	
Estimated manpower 1/4 FTE/year	Estimated cost \$35,000/year	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California Dept. of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator Leon Alevantis, Ventilation Engineer		Telephone No. (415) 540-2132
Descriptive project title Studies of Ventilation Efficiency		
Keywords (see attached list) Offices, chamber studies, ACS, air movement, forced ventilation, tracer gas (SF ₆)		
Project start June, 1989	(Envisaged) project end Ongoing	
Estimated manpower FTE 0.3	Estimated cost \$20 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Dept. of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator Steven B. Hayward, Manager	Telephone No. (415) 540-3427	
Descriptive project title Indoor Air Quality Interagency Working Group		
Keywords (see attached list) State Agencies, coordination, indoor pollutants, information exchange		
Project start FY 83 - 84	(Envisaged) project end Ongoing	
Estimated manpower FTE 0.2	Estimated cost	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Dept. of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator John R. Girman, Deputy Manager		Telephone No. (415) 540-3130
Descriptive project title Bake-out of Office Buildings to Reduce Emissions of Volatile Organic Compounds		
Keywords (see attached list) Control techniques, bake-out , building commissioning, building materials, formaldehyde, VOC, offices, new buildings, SBS, temperature, ventilation, field measurements, mitigation		
Project start June, 1988	(Envisaged) project end Ongoing	
Estimated manpower FTE 0.5	Estimated cost \$30 K This FY	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Dept. of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator John R. Girman, Deputy Manager	Telephone No. (415) 540-3130	
Descriptive project title Emissions and Modeling Exposures of TCE from Correction Fluid		
Keywords (see attached list) Exposure, emissions, ventilation, correction fluid, trichloroethylene, offices, chamber study, reformulation, Prop 65, mass-balance model		
Project start September, 1989	(Envisaged) project end June 1990	
Estimated manpower FTE 2.5	Estimated cost \$130 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Dept. of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator John R. Girman, Deputy Manager	Telephone No. (415) 540-3130	
Descriptive project title VOC Emissions from Art-Supplies		
Keywords (see attached list) Concentrations, exposure, sources of VOC, hobby activities, art pens, schools, chamber study, mass-balance model		
Project start October, 1989	(Envisaged) project end January 1991	
Estimated manpower FTE 2	Estimated cost \$130 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Dept. of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator John R. Girman, Deputy Manager	Telephone No. (415) 540-3130	
Descriptive project title VOC Sampling and Analysis Method Development		
Keywords (see attached list) VOC, buildings, emissions, sampling, analysis, standardization, validation, measurements, measurement methods, field measurements, development, sources, GC, GC-MS, sorbent		
Project start Ongoing	(Envisaged) project end	
Estimated manpower FTE 0.5 per year	Estimated cost \$60 K per year.	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Department of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator John R. Girman Deputy Manager		Telephone No. (415) 540-3130
Descriptive project title Causes of Accidental Carbon Monoxide Poisonings in California		
Keywords (see attached list) CO sources, combustion, residences, vehicles, case study, death certificates, coroner's reports, CO alarm		
Project start January 1, 1990	(Envisaged) project end January 30, 1991	
Estimated manpower FTE 1.5	Estimated cost \$100 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Department of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator Kai-Shen Liu, Epidemiologist Steven B. Hayward, Program Manager		Telephone No. (415) 540-3161 (415) 540-3427
Descriptive project title Estimating Distributions of Radon Exposure in California		
Keywords (see attached list) Exposure, radon general population, modeled approach, representative survey, passive samples, residences, population mobility		
Project start April, 1990	(Envisaged) project end March, 1991	
Estimated manpower FTE 1.5	Estimated cost \$100 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Department of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator Steven B. Hayward, Manager Indoor Air Quality Program	Telephone No. (415) 540-3427	
Descriptive project title Radon Concentrations in Residences in Ventura County and Northwestern Los Angeles County		
Keywords (see attached list) Concentrations, annual exposure, radon, residences, general population, passive samplers, representative survey		
Project start May, 1989	(Envisaged) project end October, 1990	
Estimated manpower FTE 1.25	Estimated cost \$100 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Department of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator Janet Macher		Telephone No. (415) 540-2137
Descriptive project title Studies of the Effectiveness of UV Radiation for TB Contact		
Keywords (see attached list) Bacteria, suspended particulates, hospitals, clinics, jails, tuberculosis, ventilation, biological air monitoring, field trials		
Project start January, 1990	(Envisaged) project end ongoing	
Estimated manpower FTE 0.5	Estimated cost \$30 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address California Indoor Air Quality Program California State Department of Health Services 2151 Berkeley Way Berkeley, CA 94704		a
		b
Name of principal investigator Janet Macher	Telephone No. (415) 540-2137	
Descriptive project title Studies of Indoor Microbiological Contamination		
Keywords (see attached list) Bacteria, fungi, allergy, hypersensitivity pneumonitis, complaints, infection, humidity, investigations, field studies		
Project start ongoing	(Envisaged) project end	
Estimated manpower FTE 0.4	Estimated cost \$30 K per year	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Maryland Department of the Environment Toxics, Environmental Science and Health 2500 Broening Highway Baltimore, Maryland 21224		a
		b
Name of principal investigator Katherine P. Farrell, M.D., M.P.H., Chair		Telephone No. (301) 631-3775
Descriptive project title Maryland Indoor Air Quality Task Force Report "Indoor Air Quality A common sense approach"		
Keywords (see attached list) Comfort, V.O.C. (volatile organic compounds), Asbestos radon, combustion products, bioaerosols, UFFI (urea formaldehyde foam insulation), ventilation, standards, building materials, molds, pollutants, office buildings, schools, irritation, S.B.S. (sick building syndrome).		
Project start 1989	(Envisaged) project end April, 1990	
Estimated manpower 1	Estimated cost \$10,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Minnesota Department of Health Division of Environmental Health 925 S.E. Delaware Street P.O. Box 59040 Minneapolis, MN 55459-0040		a
		b
Name of principal investigator Laura Oatman	Telephone No. 612/627-5014	
Descriptive project title Indoor Air Quality Assessment Protocol		
Keywords (see attached list) control strategies, residences, risk, health, assessment, pollutants		
Project start July 1989	(Envisaged) project end June 30, 1991	
Estimated manpower FTE 1.3	Estimated cost \$108,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Minnesota Department of Health Section of Chronic Disease and Environmental Epidemiology 717 Delaware Street, S.E. Minneapolis, Minnesota 55414		a
		b
Name of principal investigator Marian C. Marbury, Sc.D.	Telephone No. (612) 623-5216	
Descriptive project title Epidemiology of Respiratory Illness and Indoor Pollution		
Keywords (see attached list) respiratory, infection, NOx, ETS, wood stoves, residences, children, asthma, epidemiological study, passive samplers		
Project start 1989	(Envisaged) project end 1993	
Estimated manpower 2.5 FTE	Estimated cost \$350,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Environmental Health Service Division of Occupational and Environmental Health New Jersey Department of Health CN-360 Health-Agriculture Building, Room 706 Trenton, New Jersey 08625-0360		a.
		b.
Name of principal investigator Steven M. Miller, Project Manager Environmental Health Service	Telephone No. (609) 633-2043	
Descriptive project title Assessment of New Jersey's Commercial Laboratory Indoor Air Analysis Capabilities		
Keywords (see attached list) Allergens, analysis, asbestos, assessment, building materials, detection methods, ETS (environmental tobacco smoke), environmental monitoring, formaldehyde, fungi, measurement methods, residences, sampling, schools, UFFI, ventilation, VOC.		
Project start FY 89	(Envisaged) project end FY 91	
Estimated manpower FTE 0.75	Estimated cost \$50 K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address New Jersey State Department of Health Cancer Epidemiology Program and Environmental Health Service CN 360 Trenton, New Jersey 08625-0360		a
		b
Name of principal investigator Janet B. Schoenberg	Telephone No. (609) 588-3500	
Descriptive project title Case control study of radon and lung cancer in New Jersey women.		
Keywords (see attached list) Radon, residences, occupants, lung cancer, exposures, guidelines, epidemiology study, measurement		
Project start FY 86	(Envisaged) project end FY 91	
Estimated manpower FTE 18	Estimated cost \$600,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Occupational Safety and Health Division Texas Department of Health 1100 West 49th Street Austin, Texas 78756		a.
		b.
Name of principal investigator Quade R. Stahl, Environmental Quality Specialist Indoor Air Branch		Telephone No. (512)458-7254
Descriptive project title Indoor Air Program (mainly a surveillance activity)		
Keywords (see attached list) Pollutants, concentrations, sampling, environmental monitoring, analysis, household products, home textiles, aldehydes, allergan, biological, chemical, chlorinated HC, CO ₂ , VOC, ETS Fibers, formaldehyde, organic, mold, home dust, MMMF		
Project start	(Envisaged) project end Ongoing	
Estimated manpower N/A	Estimated cost N/A	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Wisconsin Department of Health & Social Services P. O. Box 309 1 West Wilson Street Madison, WI 53701		a
		b
Name of principal investigator William H. Otto, Supervisor Health Hazard Evaluation Unit		Telephone No. 608-266-9337
Descriptive project title Inhalation Exposure from Volatile Organic Compounds Found in Drinking Water		
Keywords (see attached list) Risk, residences, water passive sampling, inhalation, VOCs		
Project start Fall, 1988	(Envisaged) project end 1990	
Estimated manpower 1 FTE	Estimated cost \$5000.00	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Department of Chemistry 276 FB Brigham Young University Provo, UT 84602		a
		b
Name of principal investigator Delbert J. Eatough, Professor of Chemistry	Telephone No. (801) 378-6040	
Descriptive project title Exposure - Dose Relationships for Environmental Tobacco Smoke		
Keywords (see attached list) dose, emissions, exposure, variations, aerosols, chemical, ETS, NO _x , organic, PM, SVOC, ventilation, chamber study, controlled exposure, interlaboratory comparison, measurement, measurement methods, passive samplers, sampling, biological monitoring		
Project start September 1988	(Envisaged) project end June 1990	
Estimated manpower 4/year	Estimated cost \$300,000	

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Department of Chemistry Brigham Young University 276 FB Provo, UT 84602		a
		b
Name of principal investigator Delbert J. Eatough		Telephone No. (801) 378-6040
Descriptive project title Air Quality in Commercial Aircraft		
Keywords (see attached list) concentration, dose, emissions, exposure, spatial variations, water, aerosols, aldehydes, chemical, CO ₂ , ETS, NO _x , organic, ozone, PM, pollutants, comfort, complaint study, general population, air movement, forced ventilation, moisture, temperature, bioassay, sampling, field measurements, measurement methods		
Project start December 1988	(Envisaged) project end June 1990	
Estimated manpower 4/year	Estimated cost \$170,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Dept. of Environmental Science & Physiology Harvard School of Public Health 665 Huntington Ave., I-1303 Boston, MA 02115		a
		b
Name of principal investigators John Spengler, Petros Koutrakis, Yukio Yanagisawa, Haluk Ozkaynak, Barry Ryan and Margo Schwab		Telephone No. (John Spengler) (617) 432-1255
Descriptive project title Several exposure and health studies related to a variety of contaminants and microenvironments (homes, offices, vehicles, etc.)		
Keywords (see attached list) Acids, NO ₂ , SO ₂ , CO, CO ₂ , Particles, HCHO, Fibers, Radon, Biologicals, Asthma, Respiratory, Children, Adults, SBS		
Project start ongoing	(Envisaged) project end 2010	
Estimated manpower 10 professionals, 10 staff	Estimated cost 500,000/annual	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Harvard School of Public Health 665 Huntington Avenue Department of Environmental Science and Physiology Boston, MA 02115		a
		b
Name of principal investigator Petros Koutrakis Ph.D.		Telephone No. (617) 432-1268
Descriptive project title Investigation of Physical and Chemical Processes Affecting Indoor Human Exposures to Acids and Other Related Pollutants.		
Keywords (see attached list) emissions, adsorption, indoor/outdoor ratios, combustion sources, outdoor air, aerosols, acidic pollutants, ammonia, nitrogen oxides, nitrous acid, ozone, sulfur dioxide, chamber study, models, sampling, passive samplers		
Project start March 15, 1990	(Envisaged) project end March 15, 1991	
Estimated manpower FTE 5	Estimated cost \$200,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Dept of Env. Sciences Rutgers University P.O. Box 231 New Brunswick, NJ 08903		a
		b
Name of principal investigator Richard Fenske		Telephone No. (201) 932-7715
Descriptive project title Pesticide Exposure to Children in the Home following Indoor Pesticide Applications		
Keywords (see attached list) exposure, surfaces, dose, biocides, insecticides, dwellings, children, ventilation, environmental monitoring, sampling		
Project start Nov 1989	(Envisaged) project end Oct 1992	
Estimated manpower 1.0 FTE	Estimated cost \$300,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Dept of Env. Sciences Rutgers University P.O. Box 231 New Brunswick, NJ 08903		a
		b
Name of principal investigator Richard Fenske	Telephone No. (201) 932-7715	
Descriptive project title Minimizing Dermal and Respiratory Exposures to Pesticides in Greenhouses		
Keywords (see attached list) exposure, surfaces, biocides, insecticides, greenhouses, employees, forced ventilation, environmental monitoring, field trials, sampling		
Project start May 1987	(Envisaged) project end May 1990	
Estimated manpower 0.6 FTE	Estimated cost \$100,000	

**CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY**

Institute, address Environmental and Occupational Health Sciences Institute (EOHSI) UMONJ & Rutgers University 675 Hoes Lane Piscataway, NJ 08854		a
		b
Name of principal investigator Paul J. Lloy, Professor and Director Exposure Measurement and Assessment Division		Telephone No. (201) 463-4547
Descriptive project title Research on Total Exposure		
Keywords (see attached list) exposure, indoor/outdoor ratios, combustion, automobiles, PAH, VOC, aerosols, food contamination, ozone, chromium, lead, residences, sports activities, respiratory effects		
Project start FY 86	(Envisaged) project end ongoing	
Estimated manpower FTE 10	Estimated cost > \$800,000 (various sources)	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Arizona Division of Respiratory Sciences University of Arizona College of Medicine 1501 N. Campbell Avenue Tucson, Arizona 85724		a
		b
Name of principal investigator Michael D. Lebowitz James J. Quackenboss		Telephone No. 602-626-6379 602-626-6835
Descriptive project title Particulate Matter, Ozone, Indoor Pollutants and Respiratory Responses - To Study the acute health (hourly/daily), sub-chronic (6-8 hr/daily), and Chronic effects of indoor/outdoor pollutant exposures		
Keywords (see attached list) Outdoor Air, Combustion (Sources), Aerosols, HCHO (formaldehyde), Home dust, ETS, Ozone, PM (Particulate Matter), Pollutants, Residences, Airway, Asthmatic, Atopic, General Population, hyperreactivity, hypersensitivity, Inhalation, Lung Function, Respiratory (effects), Risk, Susceptable Groups, Meteorological factors, Temperature, Humidity, Epidemiology, Environmental Monitoring, Field Measurement, Models, Passive Samplers, Sampling, (SEE BELOW)		
Project start 1985		(Envisaged) project end Ongoing
Estimated manpower FTE 6.0		Estimated cost 250k/yr

Keywords: Standardization, Subjective evaluation, Validation, Questionnaires, Diaries

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Arizona Division of Respiratory Sciences University of Arizona College of Medicine 1501 N. Campbell Avenue Tucson, Arizona 85724		a
		b
Name of principal investigator Michael D. Lebowitz James J. Quackenboss	Telephone No. 602-626-6379 602-626-6835	
Descriptive project title Nitrogen Dioxide, Particulate Matter & Respiratory Responses in Asthmatics to study Indoor/Outdoor and Total Exposures to Short Term (1-4hr.) NO ₂ and daily PM; and Respiratory Function/Symptoms in Susceptible individuals?		
Keywords (see attached list) Exposure, Indoor/Outdoor Ratios, Seasonal/Spatial Variations, PM Combustion (Sources), Gas Cookers, Outdoor Air, ETS, Pollutants Nitrogen Dioxide, Residences, Traffic Related, Airway, Asthma, Analysis, Data Base, Environmental Monitoring, Epidemiological Study, Models, Passive Samplers, Children, Lung Function, Susceptible Groups, Respirator (effects)		
Project start 1988	(Envisaged) project end Ongoing	
Estimated manpower 3.0	Estimated cost 150k/yr	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Arizona Division of Respiratory Sciences University of Arizona College of Medicine 1501 N. Campbell Avenue Tucson, Arizona 85724		a
		b
Name of principal investigator Mary Kay O'Rourke		Telephone No. 602-626-6379
Descriptive project title Indoor Biological Agents: Exposure and Response in Allergy and Asthma (air pollution, aeroallergens and airway obstructive disease)		
Keywords (see attached list) Exposure, Indoor/Outdoor Ratios, Seasonal Variations, Outdoor air, Allergans, Fungi, House Dust, Mold, Residences, Allergy, Atopic Hypersensitivity, Irritation, Meteorological factors, Epidemiological Study, Measurement, Lung function		
Project start 1-90	(Envisaged) project end 12-94	
Estimated manpower 3.5 FTE	Estimated cost 150k/yr.	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator Richard A. Wadden, PhD Peter A. Scheff, PhD John E. Franke, PhD		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Emission Factors for Vapor Degreasers		
Keywords (see attached list) mass emission factors, degreasing, engineering controls, trichloroethylene, local exhaust, atomic absorption, infrared spectroscopy, diffusivities, model		
Project start 3/88	(Envisaged) project end ongoing	
Estimated manpower 1.0 FTE	Estimated cost	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator John E. Franke, PhD Richard A. Wadden Peter A. Scheff		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Some Observations of Eddy Diffusivities in Industrial Settings		
Keywords (see attached list) emissions, concentrations, air change rate, point source, degreasing, electroplating, trichloroethylene, chromium, nickel, industrial building, air movement, wind speed.		
Project start 1986	(Envisaged) project end ongoing	
Estimated manpower 0.1 FTE	Estimated cost	

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CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator John E. Franke Richard A. Wadden Peter A. Scheff		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Activity Based Emission Factors for Indoor Sources		
Keywords (see attached list) emission rates, activity-based emission factors, mass balance, completely mixed concept, two-point diffusion, diffusion-advection, welding, grinding, degreasing, electroplating		
Project start 1986	(Envisaged) project end ongoing	
Estimated manpower 0.25 FTE	Estimated cost	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator Peter A. Scheff Richard A. Wadden		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Trace Element Analysis in an Electroplating and Metal Finishing Shop		
Keywords (see attached list) emissions, TLV, PIXE (Proton Induced X-ray Emissions), low-concentration data, atomic absorption, metals, metal finishing plant, nondestructive evaluation, multi-elemental results		
Project start 3/88	(Envisaged) project end ongoing	
Estimated manpower 0.10 FTE	Estimated cost	

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CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator Peter A. Scheff, PhD Robert L. Friedman		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Emissions of Freon from Two Open Top Vapor Degreasers		
Keywords (see attached list) emissions, vapor degreasers, solvents, trichloroethylene, 1,1,1-trichloroethane, methylene chloride, freon, electronics manufacturing, gas chromatography, infrared adsorption spectrometry		
Project start 1/89	(Envisaged) project end ongoing	
Estimated manpower .25 FTE	Estimated cost	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator Richard A. Wadden, PhD Peter A. Scheff, PhD Barbara A. Bates		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Indoor Air Pollution		
Keywords (see attached list) concentration, guidelines, standards, furniture, gas cookers, harbour sludge, household products, combustion sources, emission factors, UFF1, soil characteristics, aerosols, asbestos, CO ₂ , NO _x , radon, solvents, buildings, dwellings, mobile homes, new buildings, offices, residences, cancer, complaints, infection, occupants, physiological reactions, SBS, respiratory effects		
Project start 7/88	(Envisaged) project end 6/90	
Estimated manpower 0.1 FTE	Estimated cost	

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CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator Richard A. Wadden, PhD David I. Baird		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Ethanol Emissions from Glazing During Candy Production		
Keywords (see attached list) emission rate, concentration, ethyl alcohol, solvents, factory line, local ventilation, workroom air, gas analyzer		
Project start 6/89	(Envisaged) project end 8/90	
Estimated manpower 1.0 FTE	Estimated cost	

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CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator Lorraine M. Conroy, ScD		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Capture Efficiency of Local Exhaust Hoods		
Keywords (see attached list) control techniques, tracer gas, industrial settings, forced ventilation, measurement of velocity and capture efficiency, models, validation		
Project start 8/1/89		(Envisaged) project end 7/31/91
Estimated manpower 0.5 FTE		Estimated cost 30,000

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator Lorraine M. Conroy, ScD		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Effects of Buoyant Sources on Capture Efficiency of Slot Hoods		
Keywords (see attached list) control techniques, tracer gas, industrial settings, forced ventilation, measurement of velocity and capture efficiency, models, validation		
Project start 7/3/89	(Envisaged) project end 6/30/90	
Estimated manpower 0.3 FTE	Estimated cost 8,000	

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CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Illinois at Chicago School of Public Health Environmental & Occupational Health Sciences P.O. Box 6998 Mail Code 922 Chicago, IL 60680		a
		b
Name of principal investigator Lorraine M. Conroy, ScD		Telephone No. (312) 996-8855 FAX (312) 996-1374
Descriptive project title Field Study of Local Exhaust Ventilation Performance		
Keywords (see attached list) solvents, industrial settings, air movement, forced ventilation, environmental monitoring, field measurements, models, sampling, validation, dry cleaning		
Project start 9/30/89	(Envisaged) project end 9/29/92	
Estimated manpower 1.5 FTE	Estimated cost 140,000	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of New Mexico School of Medicine Cancer Center New Mexico Tumor Registry 900 Camino de Salud, NE Albuquerque, NM 87131		a
		b
Name of principal investigator Jonathan M. Samet, M.D.		Telephone No. (505) 277-5541
Descriptive project title NO ₂ and Respiratory Infections in Infants		
Keywords (see attached list) Gas cookers, residences, infection, respiratory, NO _x , epidemiology		
Project start 07/01/87	(Envisaged) project end 06/30/92	
Estimated manpower 14.0 FTE	Estimated cost -0-	

Form of the COST 613 Inventory of Indoor Air Research.

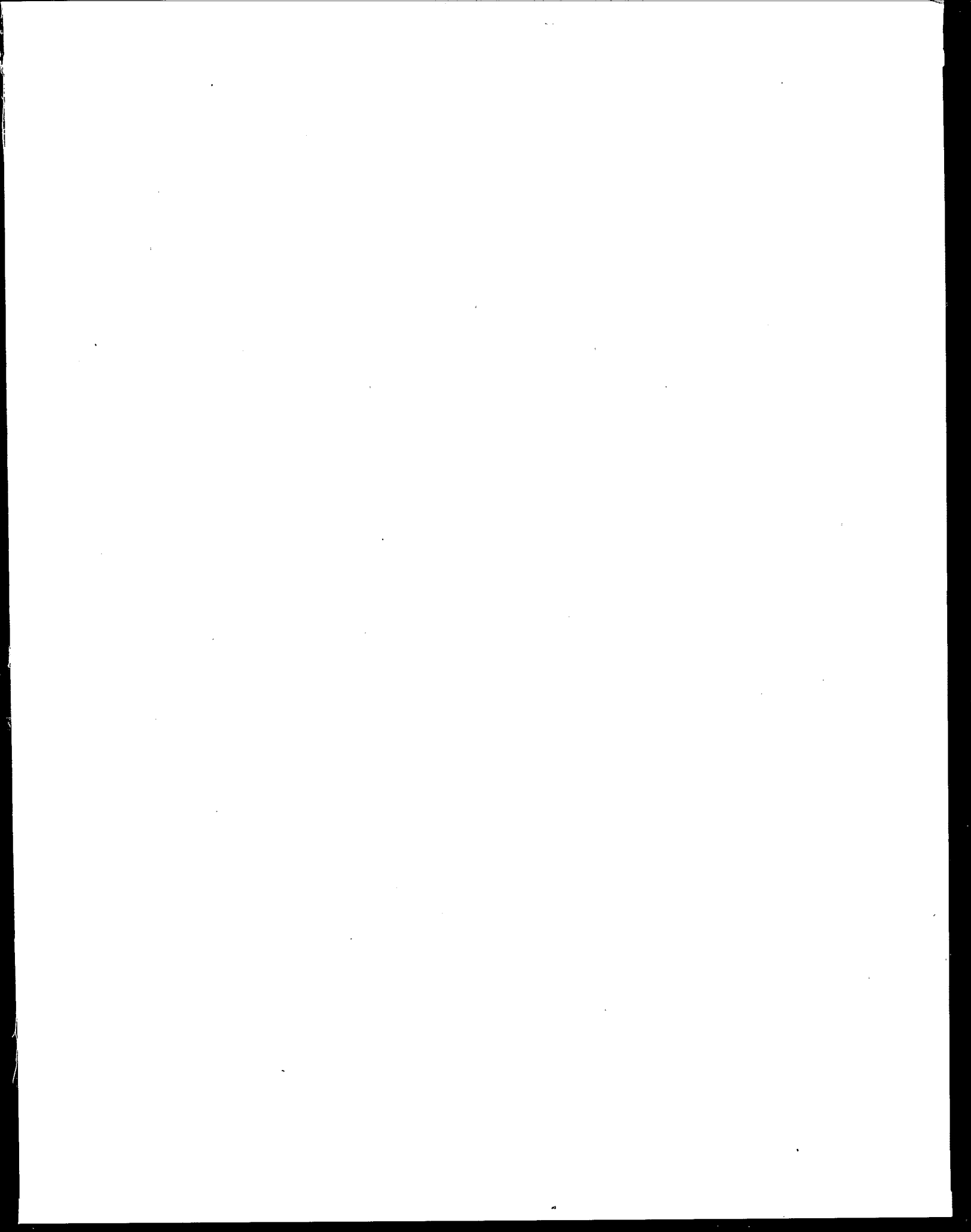
CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address University of Pittsburgh Graduate School of Public Health Pittsburgh, PA 15261, USA and Carnegie Mellon University Department of Civil Engineering Pittsburgh, PA 15213, USA		a
		b
Name of principal investigator Julian B. Andelman, University of Pittsburgh Cliff I. Davidson, Carnegie Mellon University Mitchell J. Small, Carnegie Mellon University	Telephone No. 412/624-3113 412/268-2951 412/268-8782	
Descriptive project title Inhalation Exposure in the Home to Volatile Organic Constituents of Drinking Water		
Keywords (see attached list) concentrations, exposure, variations (of concentrations/exposure), sources, drinking water, water, SVOC, VOC, dwellings, chamber study, field measurements, modeled approach, models		
Project start FY86	(Envisaged) project end ongoing	
Estimated manpower FTE 2.0/yr	Estimated cost \$600K	

Form of the COST 613 Inventory of Indoor Air Research.

CONCERTED ACTION "INDOOR AIR QUALITY AND ITS IMPACT ON MAN"
(COST 613) PROJECT INVENTORY

Institute, address Department of Epidemiology and Public Health Yale University School of Medicine 60 College Street, P.O. Box 3333 New Haven, CT 06510		a
		b
Name of principal investigator Jan A. J. Stolwijk	Telephone No. (203) 785-2867 FAX: (203) 785-7296	
Descriptive project title Indoor Air Quality and Productivity		
Keywords (see attached list) cost/benefit, energy conservation, reactions, exposure building equipment, office buildings, employee productivity, SBS, ventilation, temperature, human controlled exposure		
Project start 1/89	(Envisaged) project end 1/91	
Estimated manpower FTE 1.0	Estimated cost \$50K	



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