



Current Federal Indoor Air Quality Activities

Prepared with the cooperation of the
Interagency Committee on Indoor Air Quality (CIAQ)



ABOUT THIS PUBLICATION

With the help of the Interagency Committee on Indoor Air Quality (CIAQ), EPA has published a list of Federal indoor air quality activities each year since 1988. This publication is the 1990 update of that list.

Title IV of the Superfund Amendments and Reauthorization Act (SARA) of 1986 requires EPA to establish a committee comprised of the Federal agencies concerned with various aspects of indoor air quality (IAQ) and to coordinate Federal IAQ activities. The CIAQ functions as the primary Federal coordination mechanism.

Through the CIAQ, each Federal agency is asked to supply a yearly update of its current and ongoing research, policy, and program development activities in the field of indoor air quality. The responses to that request make up the content of this publication. The primary purpose of compiling this information is to provide individuals in the Federal community with a useful tool for coordinating their activities at the project level. This publication has proven to be useful to many individuals and organizations outside the Federal government as well.

For each agency, the major indoor air activities are identified, along with a brief description of the activity, its current status and/or projected completion date, the agency/office responsible, and a contact name and phone number. In addition, this update of the list also includes a section listing the indoor air related publications for the public that are available from Federal agencies. Due to inevitable changes in the status of many of these activities, this list will be updated annually.

The information for this chart was compiled by the Indoor Air Division, Office of Air and Radiation (ANR-445), U.S. Environmental Protection Agency, 401 M Street S.W., Washington, D.C. 20460.

PLEASE NOTE:

THE INFORMATION CONTAINED IN THIS PUBLICATION WAS CURRENT AS OF AUGUST 1990. HOWEVER, ALL INFORMATION SHOULD BE CONSIDERED SUBJECT TO CHANGE WITHOUT NOTICE. FOR THE MOST CURRENT INFORMATION, INDIVIDUALS LISTED FOR EACH PROJECT SHOULD BE CONTACTED DIRECTLY.

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GLOSSARY OF NAMES AND ACRONYMS OF FEDERAL GOVERNMENT AGENCIES/OFFICES (CIAQ MEMBERS)

CIAQ Interagency Committee on Indoor Air Quality

OTTRS Office of Technology Transfer and Regulatory Support

RREL Risk Reduction Engineering Laboratory

CIAQ Co-Chair Agencies:

EPA **U.S. ENVIRONMENTAL PROTECTION AGENCY**

OA Office of Administrator

OPTS **Office of Pesticides and Toxic Substances**

OTS Office of Toxic Substances

OPP Office of Pesticides Programs

OARM **Office of Administration and Resource Management**

OW **Office of Water**

ODW Office of Drinking Water

EHSD Environmental Health and Safety Division

OPPE **Office of Policy and Program Evaluation**

OAR **Office of Air and Radiation**

OPA Office of Policy Analysis

OAIAP Office of Atmospheric and Indoor Air Programs

ORME Office of Regulatory Management Evaluation

IAD Indoor Air Division

RID Regulatory Integration Division

ORP Office of Radiation Programs

CPSC **U.S. CONSUMER PRODUCT SAFETY COMMISSION**

ORD **Office of Research and Development**

AEERL Air and Energy Engineering Research Laboratory

DOE **U.S. DEPARTMENT OF ENERGY**

AREAL Atmospheric Research and Exposure Assessment Laboratory

PE Policy, Planning, and Analysis

OEA Office of Environmental Analysis

ECAO Environmental Criteria and Assessment Office

HERL Health Effects Research Laboratory

HHAG Human Health Assessment Group

CE Conservation and Renewable Energy

OBT Office of Building Technologies

OEETD Office of Environmental Engineering and Technology Demonstration

OHR Office of Health Research

ER Energy Research

OMMSQA Office of Modeling, Monitoring Systems, and Quality Assurance

OHER Office of Health and Environmental Research

GLOSSARY OF NAMES AND ACRONYMS OF FEDERAL GOVERNMENT AGENCIES/OFFICES (continued)
(CIAQ MEMBERS)

ORAW Office of Remedial Action and Waste
LBL Lawrence Berkeley Laboratory
NE Nuclear Energy

DHHS **U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**

CDC Centers for Disease Control
NIOSH National Institutes for Occupational Safety and Health

CEHIC Center for Environmental Health and Injury Control

CCDPHP Center for Chronic Diseases Prevention and Health Promotion

OSH Office on Smoking and Health
NCHS National Center for Health Statistics

NIH National Institutes of Health
NIEHS National Institute of Environmental Health Sciences

NIAID National Institute of Allergy and Infectious Diseases

NCI National Cancer Institute
NHLBI National Heart, Lung and Blood Institute
NIDR National Institute of Dental Research
HRSA Health Resources Services Administration
DFOBSH Division of Federal Employee Occupational Beneficiary Health Services

ATSDR Agency for Toxic Substances and Disease Registry

Other Federal Agencies:

BPA **BONNEVILLE POWER ADMINISTRATION**

DOC **U.S. DEPARTMENT OF COMMERCE**
NIST National Institute of Standards and Technology
 (formerly the National Bureau of Standards)

DOD **U.S. DEPARTMENT OF DEFENSE**
DOA Department of the Army
DON Department of the Navy
USAF U.S. Air Force
OEHL Occupational and Environmental Health Laboratory

DOI **U.S. DEPARTMENT OF INTERIOR**
NPS National Park Service
USGS U.S. Geological Survey

DOL **U.S. DEPARTMENT OF LABOR**
OSHA Occupational Safety and Health Administration

DOS **U.S. DEPARTMENT OF STATE**

DOT **U.S. DEPARTMENT OF TRANSPORTATION**
OST Office of the Secretary of Transportation

GLOSSARY OF NAMES AND ACRONYMS OF FEDERAL GOVERNMENT AGENCIES/OFFICES (continued)
(CIAQ MEMBERS)

| | |
|-----------------|-------------------------------------------------------------|
| GSA | GENERAL SERVICES ADMINISTRATION |
| NCR | National Capital Region |
| HUD | U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT |
| PD&R | Office of Policy Development and Research |
| LOC | LIBRARY OF CONGRESS |
| CRS | Congressional Research Service |
| NASA | NATIONAL AERONAUTICS AND SPACE ADMINISTRATION |
| TVA | TENNESSEE VALLEY AUTHORITY |

OTHER ACRONYMS/ABBREVIATIONS

| | |
|-----------------------|----------------------------------------------------------------------------|
| ALA | American Lung Association |
| ASHRAE | American Society of Heating, Refrigerating, and Air-Conditioning Engineers |
| ASTM | American Society for Testing and Materials |
| CO | Carbon Monoxide |
| CEC | Commission of European Communities |
| CIRRPC | Committee for Interagency Radiation Research and Policy Coordination |
| ETS | Environmental Tobacco Smoke |
| FDA | Food and Drug Administration |
| HSIA | Halogenated Solvents Industry Association |
| HVAC | Heating, Ventilating, and Air Conditioning |
| IAP | Indoor Air Pollution |
| IAQ | Indoor Air Quality |
| IAQIV | Indoor Air Quality and Infiltration/Ventilation |
| MCLs | Maximum Contaminant Levels |
| MOU | Memorandum of Understanding |
| NEA | National Education Association |
| NESHAPs | National Emission Standards for Hazardous Air Pollutants |
| NHANES III | Third National Health and Nutrition Examination Survey |
| NO₂ | Nitrogen Dioxide |
| PAHs | Polycyclic Aromatic Hydrocarbons |
| PTA | Parents and Teachers Association |
| SARA | Superfund Amendments and Reauthorization Act of 1986 |
| pCi/l | Picocuries per liter |

OTHER ACRONYMS/ABBREVIATIONS (continued)

| | |
|--------------|---------------------------------------|
| SBS | Sick Building Syndrome |
| SVOCs | Semivolatile Organic Chemicals |
| TEAM | Total Exposure Assessment Methodology |
| UL | Underwriters' Laboratory |
| VOCs | Volatile Organic Chemicals |

INDOOR AIR ACTIVITIES WITHIN THE U.S. ENVIRONMENTAL PROTECTION AGENCY

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------------------------|
| CONSOLIDATED INDOOR AIR ACTIVITIES | | | | |
| Overview and Coordination | | | | |
| CIAQ Co-chair | Coordinate Federal research and policy on IAQ issues. | Ongoing. | EPA/OAR/OAIAP | Bob Axelrad (703) 308-8470 (FTS) 398-8470 |
| Federal Indoor Air Quality Activities | Describe Federal IAQ activities. | Published annually since 1988. | EPA/OAR/OAIAP | Betsy Agle (703) 308-8470 (FTS) 398-8470 |
| Policy Development | | | | |
| Credentiailling Study | Assess possibility and desirability of setting up system for credentiailling individuals or firms that provide diagnostic and remedial indoor air quality services. | First meeting: 5/90. First interim report complete. Report on existing credentiailling programs: 9/90. | EPA/OAR/OAIAP | David Mudarri (703) 308-8470 (FTS) 398-8470 |
| Research Plan on Multiple Chemical Sensitivity | Provide funding to the National Academy of Sciences to define research needs on the issue of multiple chemical sensitivity. | Final report anticipated: Summer/Fall 1991. | EPA/OAR/OAIAP | Pauline Johnston (703) 308-8470 (FTS) 398-8470 |
| Training Needs Analysis | Develop long-range training plan. | Draft strategy: Fall 1990. | EPA/OAR/OAIAP | Camille Lee (703) 308-8470 (FTS) 398-8470 |
| Buildings Program | | | | |
| IAQ Guidance Document for Existing Public and Commercial Buildings | Provide guidance on diagnosis, correction, and prevention of IAQ problems in existing public and commercial buildings. | Draft manual: Fall 1990. Anticipated date for final manual: Spring 1991. | EPA/OAR/OAIAP | Betsy Agle (703) 308-8470 (FTS) 398-8470 |
| Manual for Prevention of IAQ Problems in New Home Construction | Provide guidance to homebuilders, architects, and homeowners on techniques to prevent IAQ problems in the construction of new homes. | Draft released: 4/90. Anticipated date for final document: Winter/Spring 1991. | EPA/OAR/OAIAP | Betsy Agle (703) 308-8470 (FTS) 398-8470 |

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| Model School District Indoor Air Quality Management Plan | Develop model school IAQ management plan for school districts. | Draft manual anticipated: 1/91. Completion date for model management plan scheduled for: Fall 1991. | EPA/OAR/OAIAP | David Mudarri (703) 308-8470 (FTS) 398-8470 |
| IAQ Guidance Document for New or Remodelled Public and Commercial Buildings | Provide guidance on preventing IAQ problems in new commercial and public buildings. | Draft manual: Winter 1991. Anticipated date for final manual: 1992. | EPA/OAR/OAIAP | Bob Axelrad (703) 308-8470 (FTS) 398-8470 |
| IAQ/Radon in Large Buildings | Explore IAQ/radon mitigation link in schools and other large buildings. | Initiated: Summer 1990. | EPA/OAR/OAIAP | David Mudarri (703) 308-8470 (FTS) 398-8470 |
| | | | EPA/OAR/ORP | Bob Thompson (202) 475-9623 (FTS) 475-9623 |
| Private Sector Survey | Identify and characterize private sector firms providing IAQ diagnostic and mitigation services. | Final report completed: 11/89. Survey of IAQ Diagnostic and Mitigation Firms (Available from NTIS: publication number PB 90-130469). | EPA/OAR/OAIAP | David Mudarri (703) 308-8470 (FTS) 398-8470 |
| Hazards-in-Schools Project | Coordinate EPA outreach to schools on environmental concerns. Produce comprehensive resource document in addressing environmental hazards in schools. | Resource document on asbestos, radon, IAQ, lead in drinking water, and other issues in preparation. | EPA/OPTS/OTS | Barbara McCoy (202) 382-3790 (FTS) 382-3790 |
| | | | EPA/OAR/ORP | Anita Schmidt (202) 475-9615 (FTS) 475-9615 |
| | | | EPA/OAR/IAQ | David Mudarri (703) 308-8470 (FTS) 398-8470 |
| | | | EPA/OW/ODW | Jeff Cohen (202) 382-5456 (FTS) 382-5456 |
| Cost of IAQ Controls in Commercial Buildings | Assess energy and non-energy costs of controlling indoor air pollution. | Draft: Winter 1991. | EPA/OAR/OAIAP | David Mudarri (703) 308-8470 (FTS) 398-8470 |

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| Pollutant/Source Program | | | | |
| Environmental Tobacco Smoke: Assessment of Lung Cancer in Adults and Respiratory Disorders in Children | Prepare an EPA assessment of risk of lung cancer in adults and respiratory symptoms in children from exposure to environmental tobacco smoke. | Draft released: 6/90. Anticipated completion date: Winter 1990/1991. | EPA/ORD/HHAG EPA/OAR/OAIAP | Steve Bayard (202) 382-5722 (FTS) 392-5722 Bob Axelrad (703) 308-8470 (FTS) 398-8470 |
| Environmental Tobacco Smoke: A Guide to Workplace Smoking Policies (w/DHHS) | Provide technical and policy guidance for reducing risks from environmental tobacco smoke in the workplace. | Draft released: 6/90. Anticipated completion date: Winter 1990/1991. | EPA/OAR/OAIAP | Bob Axelrad (703) 308-8470 (FTS) 398-8470 |
| Physician's Guide to Indoor Air Pollution | Provide guidance to practicing physicians about major indoor air pollutants, their sources and health effects, and appropriate control strategies. Also provide guidance on how to diagnose suspected IAQ-related complaints. | Draft anticipated: Spring 1991. | EPA/OAR/OAIAP | Elissa Feldman (703) 308-8470 (FTS) 398-8470 |
| Intergovernmental Program | | | | |
| Introductory IAQ Course Module (w/PHS and NEHA) | Provide introductory IAQ training manual and reference guide to State and local officials. | Anticipated completion date: Fall 1990. | EPA/OAR/OAIAP | David Mudari (703) 308-8470 (FTS) 398-8470 |
| Regional Pilot Project (Seattle) | Develop model regional public information program. | In progress. | EPA/OAR/OAIAP | Dave Kircher (206) 442-4198 (FTS) 399-4198 |
| NATO-CCMS Pilot Study | Explore and inventory research and risk management strategies of member countries. | Proceedings of 2 meetings available. | EPA/OAR/OAIAP | Elissa Feldman (703) 308-8470 (FTS) 398-8470 |
| IAQ Orientation Training | Develop 2-day introductory IAQ course targeted to Federal, State, and local government employees. | Region III pilot scheduled: Winter 1990/1991. | EPA/OAR/OAIAP | Camille Lee (703) 308-8470 (FTS) 398-8470 |

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| Public Information Program | | | | |
| Publication and Distribution of IAQ Materials | Develop appropriate written materials that describe indoor air quality problems and mitigation/prevention actions for the general public. | See publications section. | EPA/OAR/OAIAP | Elissa Feldman (703) 308-8470 (FTS) 398-8470 |
| National IAQ Information Clearinghouse | Provide information on technical and non-technical aspects of IAQ to the scientific and service communities, all levels of government, and the general public. | Draft development plan: 11/90. Clearinghouse expected to be operational: end of FY 91. | EPA/OAR/OAIAP | Elissa Feldman (703) 308-8470 (FTS) 398-8470 |
| Consumer Information Kit (w/CPSC and NEHA) | Provide State and local governments with consumer information materials. | Completed: 7/90. | EPA/OAR/OAIAP | David Mudarril (703) 308-8470 (FTS) 398-8470 |
| | | | CPSC | Ken Giles (301) 492-6590 (FTS) 492-6590 |
| IAQ RESEARCH ACTIVITIES | | | | |
| Program Management | | | | |
| Matrix Manager: ORD IAQ Research Program | Identify and coordinate research needed to fill existing information gaps. | Ongoing. | EPA/ORD/ECOA | Michael Berry (919) 541-4172 (FTS) 629-4172 |
| Headquarters Coordinator, EPA IAQ Research Program | Headquarters coordination of EPA Indoor Air Research Program. | Ongoing. | EPA/ORD/OTTRS | Kevin Teichman (202) 382-7669 (FTS) 382-7669 |
| Research Coordinator for the Committee on Indoor Air Quality (CIAQ) | Coordinate Federal government research efforts related to IAQ. | Ongoing. | EPA/ORD/OTTRS | Kevin Teichman (202) 382-7669 (FTS) 382-7669 |
| ORD Indoor Air Research Budget | Coordinate Federal government research efforts related to IAQ. | Ongoing. | EPA/ORD/ECOA | Norman Childs (919) 541-2229 (FTS) 629-2229 |
| Program Manager: Health Effects Research Laboratory's IAQ Research Program | Coordinate the health effects research studies of the indoor air program. | Ongoing. | EPA/ORD/HEPL | Dan Costa (919) 541-2531 (FTS) 629-2531 |

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| Headquarters Coordinator, EPA IAQ Health Effects Research | Headquarters coordination of EPA IAQ health effects research. | Ongoing. | EPA/ORD/OHR | Sue Perlin (202) 382-5877 (FTS) 382-5877 |
| Program Manager: Air and Energy Engineering Research Laboratory's IAQ Research Program | Coordinate the emissions testing, modeling, chamber studies, and test-home studies of the indoor air program. | Ongoing. | EPA/ORD/AEERL | Gene Tucker (919) 541-2746 (FTS) 629-2746 |
| Headquarters Coordinator, EPA IAQ Engineering Research | Headquarters coordination of EPA IAQ source characterization and mitigation research. | Ongoing. | EPA/ORD/OEETD | Marshall Dick (202) 382-2583 (FTS) 382-2583 |
| Program Manager: Atmospheric Research and Exposure Assessment Laboratory's IAQ Research Program | Coordinate monitoring studies of the indoor air program. | Ongoing. | EPA/ORD/AREAL | Ross Highsmith (919) 541-7828 (FTS) 629-7828 |
| Headquarters Coordinator, EPA IAQ Monitoring Research | Headquarters coordination of EPA IAQ methods development and large building studies research. | Ongoing. | EPA/ORD/OMMSQA | Deran Pashayan (202) 475-8936 (FTS) 475-8936 |
| Indoor Air Reference Bibliography | Maintain an extensive bibliography of reference materials on indoor air pollution. | Publication of bibliography containing over 3,400 citations. Published annually. | EPA/ORD/ECAO | Beverly Comfort (919) 541-4165 (FTS) 629-4165 |
| ORD IAQ Research Activities Listing | Develop and maintain list of ORD IAQ activities. | Ongoing. | EPA/ORD/ECAO | Beverly Comfort (919) 541-4165 (FTS) 629-4165 |
| Monitoring | | | | |
| Low Cost Personal Monitoring Devices for Indoor Air | Develop and evaluate low cost, comfortable personal monitoring and sampling devices that can be worn during normal activities. | Lab evaluation of real time NO ₂ monitor to be completed: 10/90. Passive sampling device for ozone developed: 6/90. Lab and field evaluation of ozone passive sampler to be completed: 12/90. Prototype ozone real time monitor fabricated: 6/90. Lab and field evaluation of prototype ozone monitor to be completed: 10/90. | EPA/ORD/AREAL | Jim Mulik (919) 541-3067 (FTS) 629-3067 |

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| Monitoring Methods and Devices for Retrieving Airborne Microorganisms | Design and construct an exposure room to develop a variety of monitoring methods and samplers to retrieve airborne microorganisms. | Exposure review has been fabricated and will be operational: 9/90. | EPA/ORD/EMSL-LV | Steve Hern (702) 798-2100 (FTS) 545-2100 |
| Monitoring Support for Epidemiology Study of Asthmatics and Persons with Allergies | Provide monitoring support for a joint University of Arizona/EPA 300-home epidemiology study; assemble data on viable bacteria and fungi to which study participants are exposed. | Sample collection initiated: 7/90. | EPA/ORD/EMSL-LV | Steve Hern (702) 798-2100 (FTS) 545-2100 |
| Support for Headquarters Study (see also Exposure and Risk Assessment) | Use occupant surveys and indoor air monitoring to identify indoor air problems in selected buildings. Make appropriate recommendations for improving indoor air quality. | Exposure assessment completed: 12/89. | EPA/ORD/AREAL | Ross Highsmith (919) 541-7828 (FTS) 629-7828 |
| Portable Humidifiers Study | Evaluate the relationship between water quality used in humidifiers and the impact on indoor particle levels. | Journal article: 9/88; analysis complete: 3/89; second journal article: 9/89. | EPA/ORD/AREAL | Ross Highsmith (919) 541-7828 (FTS) 629-7828 |
| Sampling Methods for VOCs in Indoor Air | Design, develop, and evaluate an air sampler for semivolatile organic compounds that is suitable in microenvironments. | Prototype samplers complete; field evaluation complete; reports: 6/88, 11/89; papers presented: 11/89; journal articles: 11/89, 5/90, 6/90. | EPA/ORD/AREAL | Nancy Wilson (919) 541-4723 (FTS) 629-4723 |
| Methods for Chemical Characterization of Polar VOCs in Indoor Air | Develop, evaluate, and improve methodology for the characterization of semivolatile polar organic compounds. | Characterization of polar compounds ongoing; papers presented: 8/90, 5/90, 10/90; journal articles: 6/90, 9/90. | EPA/ORD/AREAL | Nancy Wilson (919) 541-4723 (FTS) 629-4723 |
| Field Study: VOCs in Indoor Exposures from Personal Activities | Identify personal activities which increase exposure to VOCs and other pollutants. | Final report: 10/89. | EPA/ORD/AREAL | Ross Highsmith (919) 541-7828 (FTS) 629-7828 |
| Demonstration Study of Microenvironmental Measurement Methods | Evaluate available sampling equipment and develop sampling protocols. | Analyses completed: 4/89; final report: 9/89. | EPA/ORD/AREAL | Ross Highsmith (919) 541-7828 (FTS) 629-7828 |
| Indoor Dispersion/Ventilation Model | Investigate the use of the NBS general indoor air quality model in diagnosing sick buildings. | Ongoing. | EPA/ORD/AREAL | John Irwin (919) 541-4567 (FTS) 629-4567 |

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| Methodology for Measuring Temporal Variability of VOCs in Indoor Air | Evaluate peak exposures to indoor pollutants from household products, combustion sources, and water off-gassing. | Final report published: 1989. | EPA/ORD/AREAL | Joachim Pleil (919) 541-4680 (FTS) 629-4680 |
| Compendium of Indoor Air Quality Measurement Methods | Compile most commonly used IAQ measurement methods for technical guidance documents. | Published: 9/90. | EPA/ORD/AREAL | Ross Highsmith (919) 541-7828 (FTS) 629-7828 |
| Methods for Sampling VOCs in Breath | Develop and improve methods for sampling VOCs in breath. Use canister for sampling very volatile VOCs and for single-breath samplings. | Report on method: 6/89. Pilot field study: 12/89. | EPA/ORD/AREAL | Bill Nelson (919) 541-3184 (FTS) 629-3184 |
| TEAM Study: Particle Study | Examine indoor concentrations of particle, (nicotine) and trace elements. | Monitoring instrument developed and tested. Small scale pilot study completed. Final report: 12/90. 175-home study scheduled in Sept-Oct. 1990 in Riverside, CA. Reports and articles on earlier TEAM studies available. | EPA/ORD/OMMSQA | Lance Wallace (703) 349-8970 (703) 349-3110 (No FTS) |
| Indoor Air Study of 10 New Public Buildings | Measure indoor air concentrations of selected VOC's in 10 new non-complaint buildings. Assess emissions from selected common building materials. | Completed. Report available. | EPA/ORD/OMMSQA | Lance Wallace (703) 349-8970 (703) 349-3110 (No FTS) |
| Health Effects Research | | | | |
| Neurobehavioral and Sensory Irritant Effects of Complex VOC Mixtures in Humans | Corroborate and extend Danish studies of human exposures to complex gas-phase organic compound mixtures which result in SBS. | Replication study final report completed: 9/89; follow-up study initiated: 6/90. | EPA/ORD/HERL | David Otto (919) 966-6226 (No FTS) |

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| Characterization of Normal and Sensitive Responses to Complex Mixtures of Volatile Organic Compounds | Characterize olfactory, trigeminal, respiratory, upper airway and pulmonary immune function responses to a mixture of VOCs. Develop measures of neurologic, respiratory and immune system responses to VOCs for use in characterizing those exhibiting symptoms of "sick building syndrome." | Ongoing. Initiated: 1990. | EPA/ORD/HERL | George Goldstein (919) 966-6204 (No FTS) |
| Inflammatory Effects of Complex VOC Mixtures in Humans | Evaluate effects of VOC exposure (related to SBS) on airway inflammatory response in humans. | Pilot study completed: 9/89; follow-up study to be initiated: 8/90. | EPA/ORD/HERL | Hillel Koren (919) 966-6254 (No FTS) |
| Pulmonary Effects of Complex VOC Mixtures in Humans | Evaluate pulmonary effects (related to SBS) of VOC exposure in humans. | Initiate data collection: 9/90. | EPA/ORD/HERL | James Prah (919) 966-6244 (No FTS) |
| Toxicological Effects of VOC Mixtures in Animal and <u>In Vitro</u> Systems | Evaluate the impact of VOC mixtures on immunological, reproductive, respiratory and/or neurobehavioral systems and assess the potential for mutagenic alterations. Construct and apply a matrix approach to assessing VOC mixtures which will enable characterization of complex mixture toxicology resulting from additivity or interactions. | Ongoing. Data collection initiated: 7/90. | EPA/ORD/HERL | Dan Costa (919) 541-2531 (FTS) 629-2531 |
| Immunotoxicological Effects of VOC Mixtures in Animals | Assess the immunotoxicity of VOC mixtures by measuring pulmonary as well as systemic immunological functions, including resistance to viral, bacterial, allergic, and neoplastic diseases. | Ongoing. Data collection initiated: 7/90. | EPA/ORD/HERL | Gary Burleson (919) 541-2555 (FTS) 629-2555 |
| Biological Markers for Environmental Tobacco Smoke (ETS) Exposure and Dosimetry | Develop, evaluate, and apply biological markers that can be used effectively in assessing the exposure and dosimetry of ETS, including molecular biomarkers for use in assessing target dose. | Interim reports (urinary cotinine) being distributed; evaluation of DNA-adducts underway; applications of biomarkers in human studies are in progress. | EPA/ORD/HERL | Joellen Lewtas (919) 541-3849 (FTS) 629-3849 |

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| Mutagenicity and Exposure Studies of Organic Emissions from Indoor Unvented Combustion Sources | Assess human exposure to air pollutants (PM ₁₀ , organics, and criteria pollutants) from kerosene heaters in mobile homes; characterize and determine genotoxicity of organic emissions from kerosene heaters. | Interim report being distributed. | EPA/ORD/HERL | Judy Mumford (919) 541-3095 (FTS) 629-3095 |
| Exposure and Risk Assessment | | | | |
| Risk Characterization Methodology for Indoor Carcinogens | Develop methodology to assess human health risks from specific categories of indoor air pollutants. Use the framework to compare the results of existing risk characterization studies. | Publication of risk characterization methodology; review of risk characterization studies; indoor concentrations of environmental carcinogens; methods of analysis for environmental carcinogens: 10/90. | EPA/ORD/ECAO | Michael Berry (919) 541-4172 (FTS) 629-4172 |
| Risk Characterization Methodology for Non-Carcinogenic Pollutants and Multiple Pollutants | Development of non-cancer risk assessment methodology, and multiple pollutant strategy; assessment of indoor biocontaminants, survey of Federal, State, and local indoor air research and research needs. | Ongoing. | EPA/ORD/ECAO | William Ewald (919) 541-4164 (FTS) 629-4164 |
| Assessment of Biological Contaminants in Indoor Environments | Prepare an information assessment of biological contaminants in indoor environments, including sources, monitoring methods, health effects, and mitigation techniques. | Study to be completed: 11/90. | EPA/ORD/ECAO | Beverly Comfort (919) 541-4165 (FTS) 629-4165 |
| Data Analysis | Graphically represent indoor air pollution exposure data, compare indoor and outdoor pollution levels, and evaluate health effects data at various exposure levels. | Ongoing. | EPA/ORD/ECAO | Michael Berry (919) 541-4172 (FTS) 629-4172 |
| IAQ Study in EPA Headquarters Building | Use occupant surveys and indoor air monitoring to identify indoor air quality problems in selected buildings. Make appropriate recommendations for improving indoor air quality. | Occupant survey report (Volume I): 11/89. Air quality monitoring report (Volume II): 5/90. Anticipated completion of final report (Volume III): Fall 1990. | EPA/OARM/EHSD EPA/ORD/OHEA | Jeff Davidson (202) 382-3640 (FTS) 382-3640 Hugh McKinnon (202) 382-5898 (FTS) 382-5898 |

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| Source Characterization and IAQ Control | | | | |
| Chamber Studies of Organic Emissions from Material Sources | Develop methods for determining emissions from indoor materials/products; evaluate the effects of environmental variables on emission rate; evaluate indoor "sink" materials and describe their adsorption and re-emission characteristics; evaluate source modifications as IAQ control techniques. | Ongoing. ASTM Standard Guide on small chamber testing: 5/90; 20 technical papers and presentations completed: 5/90. | EPA/ORD/AEERL | Bruce Tichenor (919) 541-2991 (FTS) 629-2991 |
| Chamber Studies of Emissions from Unvented Combustion | Develop emission factors for organic pollutants from unvented combustion sources; develop emission models; rank the health significance of sources. | Further characterization of acid aerosols from kerosene heaters: 2/89; reports completed: 10/89. | EPA/ORD/AEERL | James White (919) 541-1189 (FTS) 629-1189 |
| Leakage from Vented Gas-fired Appliances | Evaluate leaks of flue gas from vented gas appliances in homes. | Phase II evaluation of 200 homes completed: 9/89; published: 3/90. | EPA/ORD/AEERL | James White (919) 541-1189 (FTS) 629-1189 |
| Evaluation of Indoor "Sinks" | Determine the behavior of indoor materials that act as sinks for organic compounds; develop data that describe the rate at which organics are adsorbed by and re-emitted from indoor sinks. | Ongoing. Initial results presented at Indoor Air '90, Toronto: 8/90. | EPA/ORD/AEERL | Bruce Tichenor (919) 541-2991 (FTS) 629-2991 |
| Test House Studies of Indoor Sources | Develop emissions testing procedures for organic compounds; generate emission factors and models; compare these to chamber measurements. | Ongoing. Unvented kerosene heaters paper: 8/87; moth-cake emissions paper: 5/88; perchloroethylene emissions report: 10/88. | EPA/ORD/AEERL | John Chang (919) 541-3747 (FTS) 629-3747 |
| Acid Aerosols from Portable Kerosene Space Heaters (see also Health Effects Research) | Develop data for exposure assessment and model validation on acid aerosol emissions from kerosene space heaters used in mobile homes. | Pilot field study initiated: 2/89. | EPA/ORD/AEERL | James White (919) 541-1189 (FTS) 629-1189 |
| Procedures to Determine Air Exchange Rates | Develop accurate, low cost, easy-to-use methods to determine air exchange rates. | Research and monitoring initiated: 7/87. | EPA/ORD/AEERL | Leslie Sparks (919) 541-2458 (FTS) 629-2458 |

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| IAQ Evaluation of Three Office Buildings | Study IAQ of 3 buildings: one with a reported SBS problem, one constructed to optimize IAQ; and one control. | Initiate study: Spring 1987; complete sampling: Fall 1987. | EPA/ORD/AEERL | Gene Tucker (919) 541-2746 (FTS) 629-4930 |
| Data Base of Indoor Air Pollutant Sources (DIAPS) | Maintain an up-to-date data base of indoor air source emissions. | Ongoing. Version 2.0 released: 8/89. | EPA/ORD/AEERL | James White (919) 541-1189 (FTS) 629-1189 |
| IAQ Data Base for Organic Compounds | Compile data on measured concentrations of vapor-phase organic compounds in buildings into Lotus 1-2-3 data base. | Ongoing. Periodic update of database completed: 1/90. | EPA/ORD/AEERL | Max Samfield (919) 541-1518 (FTS) 629-1518 |
| Evaluation of IAQ Control Alternatives | Evaluate relative merits (cost and effectiveness) of methods for improving IAQ. Methods to be evaluated include low-emitting products, ventilation, and air cleaners. | Ongoing. | EPA/ORD/AEERL | Leslie Sparks (919) 541-2458 (FTS) 629-2458 |
| Soil Gas Mitigation | Apply radon mitigation techniques to a house with an organic soil gas problem to determine if the same technique will also mitigate these problems. Determine air exchange rate in sufficient detail to be able to apply IAQ model to house. | Baseline data collected: FY 1990. Collect data with mitigator system on and off: FY 1991. | EPA/ORD/AEERL | James White (919) 541-1189 (FTS) 629-1189 |
| Source Catalog | Provide a listing of sources of indoor air pollutants and possible source strengths. | Complete materials list for homes and offices and indicate which materials may be sources of indoor air emissions: FY 1990. Identify constituent emissions for selected sources: FY 1991. | EPA/ORD/AEERL | James White (919) 541-1189 (FTS) 629-1189 |
| Biocontaminate Control | Determine the effect of RH, temperature, surface moisture, and biocides on biological contaminants in the indoor air. | New. | EPA/ORD/AEERL | John Chang (919) 541-3747 (FTS) 629-3747 |

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| IAQ Model | Develop an easy-to-use tool for assessing IAQ problems, conducting risk analysis, and evaluating control options. | Ongoing. | EPA/ORD/AEERL | Leslie Sparks (919) 541-2458 (FTS) 629-2458 |
| Determination of Air Flows in Buildings | Develop low cost, easy-to-use methods for measuring air flows between rooms and HVAC, between rooms and outdoors, and other important indoor air flows (e.g., to exhaust fans). | Ongoing. | EPA/ORD/AEERL | Leslie Sparks (919) 541-2458 (FTS) 629-2458 |
| Technical Support to Program Offices | Provide short-term responses to requests from EPA program offices regarding emissions from indoor materials and products. | Ongoing. Report on perchloroethylene emission from dry cleaned fabrics for OAR and OTS: 10/88; assessments of organics emissions from Waterside Mall carpet and office partitions for OA: 8/88; evaluation of mercury from interior latex paint: in progress. | EPA/ORD/AEERL | Bruce Tichenor (919) 541-2991 (FTS) 629-2991 |
| Other Projects | | | | |
| IAQ Questions for NHANES III | Add questions to NHANES study that will permit analysis of contribution of indoor air pollution sources to health problems identified in survey. | Ongoing. | EPA/ORD/OHEA | Sherry Selevan (202) 382-2604 (FTS) 382-2604 |
| Integrated Environmental Management Project | Compare levels of air pollution inside and outside homes. Do statistical analysis of personal exposure, indoor, and outdoor data. | Air quality measurements for 30 compounds in 200 Baltimore homes completed: 1988. Final report due: 3/89. Statistical analysis due: Fall 1989. | EPA/OPPE/RID | Andy Manala (202) 382-6365 (FTS) 382-6365 |
| RADON ACTIVITIES | | | | |
| Regulatory Proposal for Radionuclides in Drinking Water | Address measurement of certain radionuclides, and collect and develop water treatment data for removal of radionuclides from drinking water in support of regulation development. | Anticipated proposed rule: 1991. | EPA/OW/ODW | Greg Helms (202) 382-7575 (FTS) 382-7575 |

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| Research on Radon Removal from Drinking Water | Assess effectiveness of radon removal techniques at point-of-entry into home and for community water supplies for both high and low concentrations of radon. | Research on removal of high levels of radon completed. Reports available. Research on removal of low levels of radon to begin: 6/91. | EPA/ORD/RREL | Kim Fox (513) 569-7820 (FTS) 684-7820 |
| Radon Education and Awareness for Health Workers | Inform health professionals about the risks associated with indoor radon. | Ongoing. | EPA/OAR/ORP | Mary Culler (202) 475-9617 (FTS) 475-9617 |
| Building Site Characterization | Investigate the methods to characterize the radon potential of building sites. | Ongoing. | EPA/OAR/ORP | Sharon Wirth (202) 475-9615 (FTS) 475-9615 |
| Butte, Montana Radon Report | Report the results of extensive measurements in 68 homes in Butte, Montana. | Final. | EPA/OAR/ORP | Mike Boyd (202) 475-9615 (FTS) 475-9615 |
| Comparison of Geology and Indoor Radon | Develop methodology to identify high radon potential areas. | Ongoing. | EPA/OAR/ORP | Sharon Wirth (202) 475-9615 (FTS) 475-9615 |
| Committee on Indoor Air Quality and Radon Workgroup (w/DOE) | Provide updates to the CIAQ on pending federal radon legislation, ongoing programs, and other issues. | Ongoing. | EPA/OAR/ORP | Dave Rowson (202) 475-9622 (FTS) 475-9622 |
| House Evaluation Program | Evaluate the cost and effectiveness of mitigation methods and provide hands-on demonstrations. | Ongoing. | EPA/OAR/ORP | David Price (202) 475-9623 (FTS) 475-9623 |
| Education in Housing Industry on Radon in Homes | Educate the building industry on state-of-the-art radon mitigation and prevention techniques. | Ongoing. | EPA/OAR/ORP | Dave Murane (202) 475-9623 (FTS) 475-9623 |
| Land Evaluation Studies--Coastal Plain Characterization | Assist EPA in determining the geological characteristics of a low radon potential area. | Completed. | EPA/OAR/ORP | Tom Peake (202) 475-9615 (FTS) 475-9615 |
| National Equivalent Uranium Map Production (w/DOE) | Reprocess U.S. DOE National Uranium Resource Evaluation (NURE) aerial radiometric data. | Ongoing. | EPA/OAR/ORP | Sharon Wirth (202) 475-9615 (FTS) 475-9615 |

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| Technical Assistance for Indoor Radon | Deliver a national surface radium map and report using NURE summary statistics. | Ongoing. | EPA/OAR/ORP | Sharon Wirth (202) 475-9615 (FTS) 475-9615 |
| Technical Assistance for State Radon Surveys (w/DOI) | Provide geological assessments of statewide radon potential. | Ongoing. | EPA/OAR/ORP | Sharon Wirth (202) 475-9615 (FTS) 475-9615 |
| National Assessment of Radon Gas (SARA section 118(k)) | Describe locations in the U.S. where radon is found, and assess levels in these structures. Determine the level of radon gas and radon daughters which poses a health threat, and assess the health threat for structures identified above; determine methods of reducing or eliminating the human health threat of radon gas and radon daughters. Include guidance and public information materials on mitigating radon. | Completed. | EPA/OAR/ORP | Kirk Maconaughey (202) 475-9615 (FTS) 475-9615 |
| National Database of Indoor Radon Measurements | Prepare a database that will contain radon measurements made by EPA and private vendors. | New. | EPA/OAR/ORP | Sharon Wirth (202) 475-9615 (FTS) 475-9615 |
| National Residential Radon Survey | Estimate the frequency distribution of annual average radon exposures in U.S. homes using year-long measurements, and assess correlations between residential radon concentrations and various factors. | Ongoing. | EPA/OAR/ORP | Frank Marcinowski (202) 475-9615 (FTS) 475-9615 |
| New House Evaluation Program | Transfer technology for constructing radon resistant buildings to private sector, and provide data for the development of model building codes. | Ongoing. | EPA/OAR/ORP | Dave Murane (202) 475-9623 (FTS) 475-9623 |
| Radon Measurement Proficiency Program (RMP) | Test capabilities of companies measuring indoor radon, and provide the public with a mechanism for identifying qualified testing companies. | Ongoing. | EPA/OAR/ORP | Phil Jalbert (202) 475-9623 (FTS) 475-9623 |

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| Radon Measurements in Schools (School Protocol Development Study) | Collect data on radon and radon progeny concentrations in schools. | Ongoing. Interim report on study in Fairfax County, Virginia completed. Study will continue during the 1988-1989 school year. Guidance document is also available. Final guidance expected: Winter 1995. | EPA/OAR/ORP | Anita Schmidt (202) 475-9615 (FTS) 475-9615 |
| Radon Mitigation and Prevention in Workplaces | Transfer information developed by EPA on radon mitigation and prevention in larger buildings to the States and private sector. | New. | EPA/OAR/ORP | Mike Boyd (202) 475-9615 (FTS) 475-9615 |
| Revisions to EPA Radon Measurement Protocols | Revise EPA Radon Measurement Protocols to include new methods for measuring indoor radon and radon decay products. | Ongoing. | EPA/OAR/ORP | Mike Boyd (202) 475-9615 (FTS) 475-9615 |
| State/EPA Indoor Radon Survey | Help States identify areas where elevated radon levels (hot spots) may occur, and estimate the Statewide and regional frequency distribution of screening measurement results. | Ongoing. | EPA/OAR/ORP | Patty Bubar (202) 475-9615 (FTS) 475-9615 |
| State Mitigation Contractor Survey | Collect information on the size and nature of the radon mitigation and prevention industry, obtain information on the effectiveness of specific radon mitigation and prevention techniques and on the effectiveness of private sector efforts to reduce radon levels. | Completed. Report available. | EPA/OAR/ORP | John Hoombeck (202) 475-9623 (FTS) 475-9623 |
| Superfund Cooperative Project | Apply existing mitigation techniques to Superfund sites with high levels of radon to reduce human health risks. | Ongoing. | EPA/OAR/ORP | Gene Fisher (202) 475-9623 (FTS) 475-9623 |
| Workplace Protocol Development and Federal Buildings Surveys | Develop national protocols for measuring radon in workplaces. Oversee Federal agency radon surveys. | Ongoing. | EPA/OAR/ORP | Mike Boyd (202) 475-9615 (FTS) 475-9615 |

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| Radon Contractor Proficiency Program (RCPP) | Operate a voluntary proficiency program to evaluate the effectiveness of mitigation contractors. | Ongoing. | EPA/OAR/ORP | Lee Salmon (202) 475-9605 (FTS) 475-9605 |
| HQ Coordinator, EPA Radon Research Programs | Headquarters manager and contact for EPA radon research program. | Ongoing. | EPA/ORD/OEETD | Marshall Dick (202) 382-2583 (FTS) 382-2583 |
| State Indoor Radon Grants (SIRG) | Provide grant funds to establish and expand radon programs. | Ongoing. | EPA/OAR/ORP | Sylvia Malm (202) 475-9617 (FTS) 475-9617 |
| Time-of-Sale Incentives for Radon Mitigation | Identify mitigation incentives for homeowners. | Ongoing. | EPA/OPPE/ERAB | Alan Carlin (202) 382-5944 (FTS) 382-5944 |
| Environmental Contaminants in Schools | Evaluate EPA's guidance to schools about asbestos, radon, and lead in drinking water. | Received draft final report: 7/90. | EPA/OPPE/ORME | Bill O'Neill (202) 382-5487 (FTS) 382-5487 |
| Radon Mitigation in Existing Homes -- Florida | Extend understanding of fundamental process in order to develop improvements in specific mitigation approaches: sub slab depressurization; HVAC system operation; barriers to prevent radon entry; and site preparation prior to construction. | Ongoing. | EPA/ORD/AEERL | Dave Sanchez (919) 541-2979 (FTS) 629-2979 |
| Radon Mitigation in Existing Homes -- Maryland | Pursue low cost mitigation techniques for houses with relatively low to moderate initial radon concentrations. | Complete. EPA-600/8-90-056 distributed. One other report in preparation. | EPA/ORD/AEERL | Bruce Henschel (919) 541-4112 (FTS) 629-4112 |
| Radon Mitigation in Existing Homes -- New Jersey | Extend understanding of fundamental processes of radon transport, entry, and distribution in houses. Develop mathematical models to aid in understanding the mitigation process. Assess system durability; study house ventilation as a mitigation approach. | Ongoing. | EPA/ORD/AEERL | Ron Mosley (919) 541-7865 (FTS) 629-7865 |

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| Radon Mitigation in Existing Houses -- New Mexico | Assess the design and performance of mitigation systems for slab-on-grade and crawl-space houses, with conditions representative of the Southwest. | Ongoing. | EPA/ORD/AEERL | Bruce Henschel (919) 541-4112 (FTS) 629-4112 |
| Radon Mitigation in Existing Homes -- Ohio | Adapt mitigation techniques which have proven effective in other locations to the geologic and construction conditions of Ohio, and develop and demonstrate approaches (e.g., sealing) for reducing radon levels in basement houses with slightly elevated levels. | Complete. Reports: EPA-600/8-89-071 (Phase 1), EPA-600/8-90-050 (Phase 2) distributed. | EPA/ORD/AEERL | Bruce Henschel (919) 541-4112 (FTS) 629-4112 |
| Radon Mitigation in Existing Homes -- Tennessee | Provide an in-depth look at techniques which can be used to mitigate houses with crawl spaces, and focus on the most effective crawl space mitigation techniques. | Ongoing. | EPA/ORD/AEERL | Michael Osborne (919) 541-4113 (FTS) 629-4113 |
| Evaluation of Existing Radon Mitigation Systems in Pennsylvania | Evaluate active soil depressurization systems in houses having poor sub-slab communication. Assess the durability of mitigation systems that have been operating for several years. | Ongoing. | EPA/ORD/AEERL | Bruce Henschel (919) 541-4112 (FTS) 629-4112 |
| Radon Mitigation in New Construction -- Maryland/Virginia | Study fifteen homes, and evaluate the effectiveness of radon resistant construction features. | Ongoing. | EPA/ORD/AEERL | Michael Osborne (919) 541-4113 (FTS) 629-4113 |
| Radon Mitigation in New Construction -- New Jersey | Develop and demonstrate radon prevention techniques that can be used by builders of houses. | Ongoing. | EPA/ORD/AEERL | Timothy Dyess (919) 541-2802 (FTS) 629-2802 |
| Radon Mitigation in New Construction -- New York | In first phase, demonstrate radon reduction techniques in houses representing 6 structure types. Evaluate systems in houses previously mitigated. In second phase, use radon-resistant construction techniques during construction of block basement homes. | Complete. Report EPA-600/8-89-001 distributed. | EPA/ORD/AEERL | Michael Osborne (919) 541-4113 (FTS) 629-4113 |

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| "Radon Reduction Methods: A Homeowner's Guide" Brochure (4th Edition) | Gather research information from various field projects to incorporate into this brochure. | Ongoing. | EPA/ORD/AEERL | Kelly Leovic (919) 541-7717 (FTS) 629-7717 |
| School Mitigation Demonstration Program | Design and install radon mitigation techniques in schools, and establish a relationship between physical characteristics of a building and the influence on radon levels. | New. | EPA/ORD/AEERL | A.B. Craig (919) 541-2821 (FTS) 629-2821 |
| Study of Sealants and Coatings | Use laboratory data to characterize radon entry routes, study several potential surface sealants and coatings, monitor air flow rates induced through concrete block walls, and test coatings for effectiveness in reducing flow rates. | Ongoing. | EPA/ORD/AEERL | John Ruppertsberger (919) 541-2432 (FTS) 629-2432 |
| NAS Study | Examine the relationship of uranium miner data to homeowner exposure with respect to lung dosimetry. | Ongoing. | EPA/OAR/ORP | Mike Boyd (202) 475-9615 (FTS) 475-9615 |
| Ambient Air Study | Investigate and document radon ambient air concentrations throughout the U.S. | Ongoing. | EPA/OAR/ORP | Mike Boyd (202) 475-9615 (FTS) 475-9615 |
| Hazards-in-Schools Project | Coordinate EPA outreach to schools on environmental concerns. Produce comprehensive resource document in addressing environmental hazards in schools. | Resource document on asbestos, radon, IAQ, lead in drinking water, and other issues in preparation. | EPA/QPTS/OTS | Barbara McCoy (202) 382-3790 (FTS) 382-3790 |
| | | | EPA/OAR/ORP | Anita Schmidt (202) 475-9615 (FTS) 475-9615 |
| | | | EPA/OAR/IAQ | David Mudam (203) 308-8470 (FTS) 308-8470 |
| | | | EPA/OW/ODW | Jeff Cohen (202) 382-5456 (FTS) 382-5456 |
| National School Radon Survey | To develop and conduct national school survey pursuant to Section 307 of IRAA. | New. | EPA/OAR/ORP | Lisa Ratcliff (202) 475-9615 (FTS) 475-9615 |

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| Radon Public Information Activities | | | | |
| Regional Radon Training Centers | Develop information and provide training to Federal and State officials, private firms, and the public regarding health risks posed by radon. Demonstrate and teach methods of radon measurement and mitigation, and provide training and administer examinations as part of the Radon Contractor Proficiency Program. | Ongoing. | EPA/OAR/ORP | Mark Dickson (202) 475-9617 (FTS) 475-9617 |
| "Reducing Radon in Structures" Training Course | Present the "Reducing Radon in Structures" training course for radon diagnostics and mitigation. | Ongoing. | EPA/OAR/ORP | Mark Dickson (202) 475-9617 (FTS) 475-9617 |
| Evaluation of Different Reactions to Radon Information | Design a risk communication strategy that will lead to appropriate testing and mitigation. | Published. | EPA/OPPE/ERAB | Ann Fisher (202) 382-5500 (FTS) 382-5500 |
| Evaluation of EPA's Risk Communication Efforts | Produce and distribute materials regarding the effectiveness of EPA risk communication, including journal articles and EPA publications. | Ongoing. Selected titles: <i>Radon Risks: Attitudes, Perceptions and Actions</i> , EPA/230-04-89-049 August 89; <i>Alerting the Apathetic and Reassuring the Alarmed - Communicating About Radon Risk in Three Communities</i> EPA/230-08-88-036. Journal article: Winter 1990. | EPA/OPPE/ERAB | Ernestine Thomas (202) 382-5606 (FTS) 382-5606 |
| Radon in Water Pamphlet | Develop public information materials for owners of private wells containing radon. | Anticipated publication: Fall 1990. | EPA/OW/ODW | Greg Helms (202) 382-7575 (FTS) 382-7575 |
| Update Citizen's Guide to Radon | Revise and update policy and guidance to homeowners on indoor radon. | Review of draft to be completed: Fall 1990. | EPA/OAR/ORP | Mike Walker (202) 475-9617 (FTS) 475-9617 |
| Ad Council | Prepare and distribute Public Service Advertising on indoor radon including TV, radio and print. | TV PSA playing in 33 states. | EPA/OAR/ORP | Dennis Wagner (202) 475-9617 (FTS) 475-9617 |
| Radon Action Week | Develop activities in support of National Radon Action Week. | New. | EPA/OAR/ORP | Kristy Miller (202) 475-9617 (FTS) 475-9617 |

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| Public Outreach (Local) | Work with local American Lung Association chapters to develop public information and outreach activities on indoor radon. | New. | EPA/OAR/ORP | Mary Culler (202) 475-9617 (FTS) 475-9617 |
| TOXIC CHEMICALS/HOUSEHOLD PRODUCTS ACTIVITIES Asbestos Activities | | | | |
| NESHAP's Regulations (section 112 of the Clean Air Act) | Protect public health from exposure to asbestos in ambient air. | Enforcement of several regulations including ones prohibiting manufacture of spray-on asbestos insulation and molded pipe insulation and requiring appropriate procedures for demolitions and renovations involving asbestos ongoing. Revisions to regulations under development. | EPA/OAR/OAQPS | Simms Roy (919) 541-5263 (FTS) 629-5263 |
| Asbestos School Loan and Grant Program | Conduct \$45 million program to assist schools with greatest hazard and largest need to abate damaged or deteriorating asbestos. | Funded 2,400 school abatement projects involving more than \$245 million in awards since 1985. Congress considering reauthorization. | EPA/OPTS/OTS | Gina Bushong (202) 382-3790 (FTS) 382-3790 |
| Worker Protection Rule | Protect health of workers not covered by OSHA regulations. | Ongoing enforcement of rule developed in 1986 and revised in 1987. | EPA/OPTS/OTS | Dave Wagner (202) 382-3862 (FTS) 382-3862 |
| Ban and Phase Down Rule | Regulate uses of asbestos to protect public health by phasing out almost all remaining uses of asbestos products. | Final rule published: July 1989. | EPA/OPTS/OTS | Dave Wagner (202) 382-3862 (FTS) 382-3862 |
| Asbestos-Containing Materials in Schools Rule | Protect public health in schools. | Enforcement of rule promulgated in 1987. | EPA/OPTS/OTS | Gina Bushong (202) 382-3790 (FTS) 382-3790 |

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| Hazards-in-School Project | Coordinate EPA outreach to schools on environmental concerns. Produce comprehensive resource document in addressing environmental hazards in schools. | Resource document on asbestos, radon, IAQ, lead in drinking water, and other issues in preparation. | EPA/OPTS/OTS | Barbara McCoy (202) 382-3790 (FTS) 382-3790 |
| | | | EPA/OAR/ORP | Anita Schmidt (202) 475-9615 (FTS) 475-9615 |
| | | | EPA/OAR/IAQ | David Mudarri (703) 308-8470 (FTS) 398-8470 |
| | | | EPA/OW/ODW | Jeff Cohen (202) 382-5456 (FTS) 382-5456 |
| Report to Congress on Asbestos in Public and Commercial Buildings | Assess magnitude of problem and make recommendations. | Report available. EPA is addressing report recommendations. | EPA/OPTS/OTS | Joe Schechter (202) 382-3949 (FTS) 382-3949 |
| Other Chemicals/Sources | | | | |
| Formaldehyde/Pressed Wood Products | Assess risk. Identify and implement mitigation measures, if appropriate. | Updating risk assessment completed in 1987. EPA considering options for risk management of pressed wood emissions. | EPA/OPTS/OTS | George Semeniuk (202) 382-2134 (FTS) 382-2134 |
| Carpet Workgroup | Coordinate assessment of the risk of chemicals emitted from carpets and options for reducing those risks. | Action plan announced: 4/18/90. Plan now being implemented. Reviewing carpet industry studies and other sources of information. EPA response to a union petition regarding carpet. Announced: <u>Federal Register</u> 4/18/90. | EPA/OPTS/OTS | Richard Leukroft (202) 382-7319 (FTS) 382-7319 |

U.S. ENVIRONMENTAL PROTECTION AGENCY

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------|
| Integrated Chlorinated Solvents Workgroup (w/CPSC, OSHA, and FDA) | Coordinate interagency assessment of key policy issues regarding uses of 4 major solvents. Identify regulatory and non-regulatory options to reduce exposure. Risk management options selection of dry cleaning (perchloroethylene) completed: 1987. Follow-up work on identifying potential opportunities for reducing risks to consumers from dry cleaning in process. Metal cleaning work (not an IAQ problem) completed: 1988. | CPSC required labelling of methylene chloride products and is currently evaluating the efficiency of such labelling. EPA is addressing indoor air risk management issues for paint stripping, aerosols, and dry cleaning. | EPA/OPTS/OTS | Paul Campanella (202) 382-3946 (FTS) 382-3946 |
| Exposure Assessment Activities | | | | |
| Consumer Exposure Methodology and Guidelines for Collection of Data Pertaining to Inhalation Exposures in Residential Buildings | Present methods for assessing consumer exposure including models to estimate indoor air concentrations. Describe different approaches that may be used to assess exposure to toxic chemicals in indoor air in homes. | Report on methodology available. Draft guidelines on approaches for collecting data related to in-house inhalation exposure under review. | EPA/OPTS/OTS | Pat Kennedy (202) 382-3916 (FTS) 382-3916 |
| Multi-Chamber Consumer Exposure Model (MCCEM) | Computer software tool for assessing inhalation exposure to airborne concentrations of chemicals released from consumer products using air infiltration and interzonal airflow rates for user-selected or user-designed residences. | Report available. | EPA/OPTS/OTS | Pat Kennedy (202) 382-3916 (FTS) 382-3916 |
| PFT (perfluorocarbon tracer) Data Base | Improve methods for modeling exposure to contaminants in indoor air in homes. | Extensive data set of air exchange rates and interzonal air flows in homes completed: 1990. | EPA/OPTS/OTS | Pat Kennedy (202) 382-3916 (FTS) 382-3916 |
| Methodology Development for Analysis of Volatile Organic Compounds (VOCs) in Blood | Identify new methods for measuring VOCs taken into human body. | Protocol completed: 1987. No current work. | EPA/OPTS/OTS | Janet Hemmers (202) 382-3583 (FTS) 382-3583 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
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| Household Products Composition and Usage Surveys | Compile data base on use and compositions of household products and activities. Six solvents identified: methylene chloride, trichloroethylene, carbon tetrachloride, perchloroethylene, and 1,1,2-trichlorotrifluoroethane. | Report available. | EPA/OPTS/OTS | Susan Dillman (202) 382-5375 (FTS) 382-5375 |
| Human Adipose Tissue Survey | Identify levels of selected pollutants in human tissues. | Collected data: 1970-1988. Reports and journal articles available. Funded through FY 89. | EPA/OPTS/OTS | Janet Remmers (202) 382-3583 (FTS) 382-3583 |
| Toxic Substances/Household Products Public Information Activities | | | | |
| Toxic Substances Publications | Provide public with information about the uses and hazards of asbestos and other toxic substances. | See publications section for list of publications. | EPA/OPTS/OTS | Michael Stahl (202) 382-3949 (FTS) 382-3949 |
| Toxic Substances Hotline | Provide hotline service to answer questions from the public. | Ongoing. (Phone number: (202) 554-1404) | EPA/OPTS/OTS | Wanda Woodburn (202) 382-3795 (FTS) 382-3795 |
| Toxic Substances/Household Products Research Activities | | | | |
| Asbestos in Residences | Determine the amount of asbestos in residences. | Small screening study completed. | EPA/ORD/AREEL | Leslie Sparks (919) 541-2458 (FTS) 629-2458 |
| Household Products Concentrations Levels: IAQ Test House | Assess the indoor air concentrations of chemicals from use of household products in a home under controlled conditions. Compare levels found with chamber studies and indoor air quality modeling. | Ongoing. | EPA/ORD/AEERL | John Chang (919) 541-3747 (FTS) 629-3747 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
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| PESTICIDE ACTIVITIES Termiticides | | | | |
| Chlordane | Protect public from exposure to termiticides containing cyclodienes. | Halted sale of chlordane and heptachlor to pest control operations under 1987 MOU with Velsicol (sole manufacturer) unless certain conditions are met. Manufacturers have withdrawn aldrin and dieldrin from market. | EPA/OTS/OPP | Michael Firestone (202) 557-0459 (FIS) 557-0459 |
| New Termiticides | Evaluate effectiveness and toxicity of new termiticide products. | Ongoing. | EPA/OTS/OPP | Michael Firestone (202) 557-0459 (FIS) 557-0459 |
| Other Pesticide Activities | | | | |
| Non-Occupational Pesticide Exposure Survey | Measure levels of over 20 pesticides in homes. | Data collected from homes in Jacksonville, FL and Springfield, MA. Final report to be completed: 7/89. | EPA/ORD/EMS | Andrew Bond (919) 541-4329 (FIS) 629-4329 |
| Antimicrobials | Determine exposure to antimicrobials from products used in buildings accessible to general public. | Currently reviewing exposure data submitted to Agency in response to 1987 data collection request. Collection and evaluation of toxicology and exposure data ongoing. | EPA/OTS/OPP | Jim Wilson (703) 557-7470 (FIS) 557-7470 |
| Pesticide Data Requirements | Add new data requirements for pesticide application exposure and post application exposure. | Data requirements issued in proposed form: Fall 1990. | EPA/OTS/OPP | Michael Firestone (202) 557-0459 (FIS) 557-0459 |
| Inert Ingredients in Pesticides | Identify toxic inert ingredients used in pesticides and require actions by manufacturer to reduce risks to public health, as appropriate. | Implementation of 1987 policy requiring actions on both existing and new inerts is ongoing. Most products have been reformulated to remove toxic inerts. Program of collecting data on new inerts in progress. | EPA/OTS/OPP | Lynn Bradley (703) 557-0382 (FIS) 557-0382 |

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| Pesticide Public Information Activities | | | | |
| Public Information | Answer public inquiries on pesticide issues. | Maintain National Pesticide Telecommunications Network hotline (phone number: 800-858-PEST; in Texas: 806-743-3091). Brochure about NPTN available. | EPA/OPIS/OPP | Frank Davido (703) 557-0576 (FTS) 557-0576 |
| DRINKING WATER ACTIVITIES | | | | |
| Issue Maximum Contaminant Levels (MCLs) | Regulate amount of VOCs in drinking water. | Final MCLs for 8 VOCs issued: 1987. Final MCLs for additional 10 VOCs scheduled for promulgation: 12/90. MCLs for additional 3 VOCs proposed: 7/90. | EPA/OW/ODW | Al Havinga (202) 382-5555 (FTS) 382-5555 Maria Gomez-Taylor (202) 475-7274 (FTS) 475-7274 |
| Exposure Assessments for VOCs in Drinking Water | Develop model to estimate human exposure from volatilization of drinking water contaminants from showering and other sources (e.g., dishwashers, washing machines). | MCLs for additional 3 VOCs proposed: 7/90. | EPA/OW/ODW | Ken Bailey (202) 382-5535 (FTS) 382-5535 Maria Gomez-Taylor (202) 475-7274 (FTS) 475-7274 |

INDOOR AIR ACTIVITIES WITHIN THE U.S. CONSUMER PRODUCT SAFETY COMMISSION

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------|
| CIAQ Co-Chair | Coordinate Federal research and policy on IAQ issues. | Ongoing. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |
| Indoor Air "Guidance Document" for Public | Provide guidance to consumer on how to assess and decrease indoor air pollution exposure in homes from biological pollutants and asbestos. | Biologicals document completed: Spring 1990. Asbestos document to be available: Fall 1990. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 Lori Saltzman (301) 492-6477 (FTS) 492-6477 |
| Consumer Information Kit (w/CPSC and NEHA) | Provide State and local governments with consumer information materials. | Completed: 7/90. | EPA/OAR/OAIAP | Ken Giles (301) 492-6580 (FTS) 492-6580 David Mudarri (202) 475-8592 (FTS) 475-8592 |
| IAQ RESEARCH ACTIVITIES | | | | |
| Kerosene Heaters | Develop certification test method for kerosene heater emissions of NO ₂ . | Laboratory evaluation completed. Report for task group review: 8/90. | CPSC | Al Martin (301) 492-6508 (FTS) 492-6508 |
| Biological Pollutants: Kingston/Harriman Field Study | Identify sources and concentrations of biological pollutants present in air of residences (coordinated with Harvard 6-City Study). | Report available. | CPSC | Susan Womble (301) 492-6554 (FTS) 492-6554 |
| Monitoring of Biological Pollutants | Obtain monitoring data and analysis of the concentrations of biological pollutants in homes in Portage, WI, Steubenville, OH and Topeka, KS (coordinated with Harvard 6-City Study). | Multi-year investigation initiated: Winter 1987. Report completed: 1990. | CPSC | Lori Saltzman (301) 492-6477 (FTS) 492-6477 |
| Home Humidifiers, Vaporizers, and Similar Appliances | Identify bioaerosols and selected particulate emissions from certain appliances found in homes. | Chamber testing completed. Report available. | CPSC | Eva Lehman (301) 492-6477 (FTS) 492-6477 |

U.S. CONSUMER PRODUCT SAFETY COMMISSION

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------------------------|
| Carbon Monoxide (CO) Detectors | Evaluate and promote effective, low cost, reliable CO detectors to protect against acute poisonings from leaking appliances and venting systems. | Priority project. Evaluation to start: 10/91. Voluntary standards liaison ongoing. | CPSC | Jacqueline Elder (301) 492-6554 (FTS) 492-6554 |
| Health Effects of Biological Pollutants | Attempt to correlate data on housing conditions and respiratory symptoms of children with the biological pollutant monitoring data from their homes (coordinated with Harvard 6-City Study). | Analyzing data from Portage, WI, and Steubenville, OH, and Topeka, KS. Report to be completed: Summer 1990. | CPSC | Lori Saltzman (301) 492-6477 (FTS) 492-6477 |
| IAQ Macromodel for Assessing IAP from Combustion Appliances (w/DOE and EPA) | Develop and validate a macromodel for predicting indoor air pollutant concentrations. | Phase I draft report to be completed: Summer 1990. | CPSC | Warren Porter (301) 492-6477 (FTS) 492-6477 |
| IAQ Model (w/DOE and EPA) | Verify NIST model and extend user friendliness of IAQ models. | Final report expected: Fall 1990. | CPSC | J.L. Mulligan (301) 492-6508 (FTS) 492-6508 |
| NO ₂ Health Research | Measures urinary excretion of hydroxyproline, as non-invasive indicator of NO ₂ effects on lung matrix of children. | Final report completed: 1988. | CPSC | Lori Saltzman (301) 492-6477 (FTS) 492-6477 |
| Kerosene Heaters | Monitor both pollution exposure and respiratory symptoms of children in homes where kerosene heaters are used; check for associations. | Sampling performed: Winter 1986. Report completed: 1988. | CPSC | Susan Womble (301) 492-6554 (FTS) 492-6554 |
| Exposure Assessment of Asbestos in Homes | Assess potential for exposure to airborne asbestos fibers in homes with deteriorating, in-place asbestos materials. | Phase I completed in 45 homes: June 1987. Phase II sampling completed, analysis underway. Report: Summer 1989. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |
| Wood Stove Emissions | Characterize vapor and particulate polynuclear aromatic pollutants in 150 homes in Tennessee. Evaluate health impact of PAHs from wood stoves. | Sampling completed: 1986. Risk exposure and risk assessment summaries to be completed: Summer 1990. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |
| Air Filtration Appliances | Assess ability of certain types of air filter appliances on market to remove NO ₂ and certain organic gases from indoor air. | Report on the testing of four devices completed: 1988. | CPSC | Bharat Bhooshan (301) 492-6994 (FTS) 492-6994 |

U.S. CONSUMER PRODUCT SAFETY COMMISSION

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
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| Air Filters (w/NIST) | Develop standard test method for evaluating the ability of the air filters to remove gaseous contaminants. | Test protocol under development. Contract completion: 9/90. | CPSC | J.L. Mulligan (301) 492-6508 (FTS) 492-6508 |
| Carpets | Evaluate emissions from carpet samples and adhesives. Evaluate consumer complaints. | Development of protocol and pilot testing in progress. Report to be completed: Fall 1990. | CPSC | Susan Womble (301) 492-6554 (FTS) 492-6554 |
| KEY TOXIC CHEMICAL/HOUSEHOLD PRODUCTS ACTIVITIES | | | | |
| Formaldehyde | Develop voluntary standard for formaldehyde emissions from pressed wood through national consensus organization. | Task group established: Fall 1987. Comments on formaldehyde emissions levels from pressed wood to ASTM: Spring 1989. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |
| Asbestos | Reduce consumer exposure to asbestos from products. | Enforcement of labeling policy effective: 1986. Enforcement of compliance program effective: 1988. | CPSC | Charles Jacobson (301) 492-6400 (FTS) 492-6400 |
| Methylene Chloride | Assess cancer risk and reduce consumer exposure to methylene chloride through improved labeling of products. | Labeling requirement issued: 1987. General order requiring data to identify companies using methylene chloride issued: 8/90. Consumer use survey to begin: 1991. | CPSC | Charles Jacobson (301) 492-6400 (FTS) 492-6400 |
| Methylene Chloride Petition | Address petition to ban methylene chloride in consumer products. | Petition denied. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |
| Review of Methylene Chloride Actions | Evaluate impact of commission activities and reformulation on consumer exposure. | To be completed: 1991. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |

U.S. CONSUMER PRODUCT SAFETY COMMISSION

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|
| Integrated Chlorinated Solvents Workgroup (w/EPA, OSHA, and FDA) | Coordinate interagency assessment of key policy issues regarding uses of 4 major solvents. Identify regulatory and non-regulatory options to reduce exposure. Risk management options selection of dry cleaning (perchloroethylene) completed: 1987. Follow-up work on identifying potential opportunities for reducing risks to consumers from dry cleaning in process. Metal cleaning work (not an IAQ problem) completed: 1988. | CPSC required labelling of methylene chloride products and is currently evaluating the efficiency of such labelling. EPA is addressing indoor air risk management issues for paint stripping, aerosols, and dry cleaning. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |
| Kerosene Heaters | Develop voluntary standard to limit emissions of NO ₂ /CO from kerosene heaters. | Test method and predictive model to be presented to U.L. task group: 9/90. | CPSC | Susan Womble (301) 492-6554 (FTS) 492-6554 |
| Unvented Gas Space Heaters | Develop voluntary standard to limit emissions of NO ₂ from unvented gas space heaters. | Workgroup established by ANSI (Z21.11.2) to investigate revision of voluntary standard to include emission rates for NO ₂ and CO. Working group held meeting: 4/90. | CPSC | Susan Womble (301) 492-6554 (FTS) 492-6554 |
| Wood Stoves | Identify regulatory and non-regulatory options addressing emissions from wood stoves. | Report: Summer 1990. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |
| Paradichlorobenzene | Evaluate hazard to consumers from exposure to paradichlorobenzene in consumer products used indoors and develop remedial options. | Status report: Fall 1990. | CPSC | Sandra Eberle (301) 492-6554 (FTS) 492-6554 |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF ENERGY

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|
| CIAQ Co-chair | Coordinate Federal research and policy on IAQ issues. | Ongoing. | DOE/CE/OBT | John Millhone (202) 586-1510 (FTS) 896-1510 |
| IAQ RESEARCH ACTIVITIES | | | | |
| Indoor Air Quality Control Techniques | Develop, test, and evaluate energy efficient and cost-effective techniques to maintain IAQ. Conduct comprehensive and critical review of current technologies. | Research ongoing. | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |
| Organic Pollutants | Determine relationships between concentrations of airborne organic pollutant compounds in large buildings and energy conservation measures. | Continue field measurements of VOCs in commercial buildings; begin development of a source apportionment model. Report due: 9/91. | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |
| Air Infiltration Research | Develop methods to model and measure infiltration and interzonal airflows. | Establishment of an international collaborative research program on air flow modeling under consideration. | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |
| Library of Congress Study (w/EPA and NIOSH) | Develop and test methods to evaluate the movement of air into and within large buildings and measure indoor pollutants levels. (Part of continuing research on IAQIV large buildings.) | Long-term ventilation measurements being made. Report due: Fall 1990. | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |
| IAQIV Measurements | Measure IAQIV in complaint ("sick") and non-complaint buildings. | Ongoing. | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |
| Ventilation Research | Determine combinations causing ventilation loads and dilution of indoor pollutants, and develop models to quantify ventilation parameters. | Ongoing. Ventilation and pollutant removal experimentation in a unique laboratory facility. Report due: 6/91. | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |
| Scale Model Ventilation Flows Studies | Determine significance of the factors determining forced convection airflow patterns and their importance. | Ventilation efficiency scale model testing will address "cold air distribution" issues in FY 90. | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |

U.S. DEPARTMENT OF ENERGY

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------|
| IAQ Macromodel Development | Develop a macromodel to estimate residential indoor pollutant concentration distributions in the U.S. | Journal article and summary report on combustion macromodel (for CO ₂ , NO ₂ , RSP) completed: 1990; macromodel approach to PAHs, SO ₂ , and VOCs due: early FY 91. | DOE/PE/OEA | David Moses (202) 586-2061 (FTS) 896-2061 |
| IAQ Environmental Information Handbooks | Present synthesis of current data relating to indoor radon and indoor combustion sources. | Update of the health effects chapter of the 1986 Radon Handbook due: early 1991. Revised Combustion Sources Handbook to be completed: FY 91. | DOE/PE/OEA | David Moses (202) 586-2061 (FTS) 896-2061 |
| RADON RESEARCH ACTIVITIES | | | | |
| Technical Measurements Center | Aid DOE and its remedial action contractors in making reliable radon and radon-daughter measurements. | Ongoing. | DOE/ORAW | Tony Brazley (202) 353-5438 (FTS) 233-5438 |
| Energy Conservation Impacts of Indoor Radon | Minimize or eliminate the adverse energy impacts associated with radon mitigation activities. | Ongoing. | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |
| Structural Factors Influence on Radon Entry | To construct and utilize a field experimental facility to assess structural factors influence on radon entry. | Facility is constructed and instrumented. Experimentation to begin: FY 90. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| | | | DOE/CE/OBT | John Talbott (202) 586-9455 (FTS) 896-9455 |
| Hit-Size Effectiveness Function (HSEF) for Chromosome Aberrations | Obtain hit size effectiveness functions for chromosome aberrations in order to evaluate absolute risk in radiation fields of mixed linear energy transfer (e.g., radon exposure). | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Biological Effectiveness of Radon Alpha Particles | Investigate malignant transformation of mammalian cells exposed to single and successive alpha particles. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

U.S. DEPARTMENT OF ENERGY

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
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| Lung Cancer Risk from Inhalation of Radon and Other Pollutants | Produce data in rats that will be helpful in assessing the carcinogenic risk of radon inhaled either alone or combined with pollutants commonly found in the home environment. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Chemical and Physical Processes Associated with Distribution and Effects | Study the thermochemistry and kinetics of radon progeny and their secondary reaction products. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Energy Deposition and Radiation Quality of Radon and Radon Daughters (w/DOC) | Create a quantitative microdosimetric description of the interaction of alpha particles from radon/radon daughters with the cells at risk in the lung and adjacent areas. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Molecular Mechanisms of Radiation-Induced Mutations in Human Cells | Study the mechanistic basis for gene mutation induced by ionizing-radiation in normal fibroblasts. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Radon Indicator in the Indoor Environment | Improve the knowledge about the transferring processes leading from airborne radon/radon daughters to embedded Po-210 in hard surfaces in the indoor environment. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Gas Transport in Soils and Its Relation to Radon Availability | Furnish more quantitative information about the control of radon diffusion and flow of radon-bearing air by soil characteristics such as layering, water retention, grain size, and grain orientation. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Development of a Data Base on U.S. Homes and Applications | Maintain and expand the University of Pittsburgh data base on radon in U.S. homes and exploit applications of the information contained in it. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Assessment of Indoor Thoron and Its Progeny | Determine if indoor levels of thoron (Rn-220) make a significant contribution to the radiation dose received by man from the environment. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

U.S. DEPARTMENT OF ENERGY

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| Regional Aerosol Deposition in Human Upper Airways | Elucidate important factors which influence overall and local deposition of aerosols in the human airways above the trachea. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Radon Permeability in Soil: A Method for Prediction | Develop and verify a method of estimating radon permeability in soil. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Molecular Mechanisms of Radiation-Induced Mutations in Human Cells | Study the cellular and molecular basis for gene and chromosomal mutations induced by high linear energy transfer α -particles in human cells. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Effects of Vegetation on Radon Transport Processes in Soil | Determine how radon concentrations in subterranean structures are influenced by atmospheric conditions and soil conditions including the indoor-outdoor gradients of pressure, temperature and radon concentrations. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Cancer Risk from Radon and Inhaled Indoor Pollutants | Measure DNA strand breaks in tracheal cells of rats exposed to Po-210 (a radon surrogate) in combination with cigarette smoke or NO ₂ . | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Indoor Atmospheric Chemistry: Interactions of Radon with Other Gaseous Pollutants | Provide information on and understand the nature of the interactions of radon and its progeny with gaseous indoor pollutants found in high concentrations in homes and its potential significance to human health. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Studies of the Molecular Damage in Neoplastic Transformation Caused by Alpha Radiation from Radon Progeny | Provide experimental information of the mechanisms of cell neoplastic transformation from low energy helium ions at the physical, chemical, and molecular levels, and provide biophysical models of the transformation process. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

U.S. DEPARTMENT OF ENERGY

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
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| Generation and Mobility of Radon in Soil | Evaluate the extent and nature of uranium and radium depletion and/or enrichment in soil horizons, as a function of climate and other factors affecting soil characteristics. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Aerosol Microphysics of Indoor Radon | Contribute to the ability to model airborne radioactivity associated with indoor aerosols by providing quantitative descriptions of the rates of interaction and growth for aerosol particles. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Dosimetry and Cell Killing | Provide an alpha particle exposure facility and the related dosimetry and conduct basic studies of cell killing, mutation, and transformation. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Activation of Oncogenes by Radon Progeny and X-Rays | Study the carcinogenic effect of radon progeny at the molecular level, utilizing techniques developed in molecular biology, cancer cell biology, and radiation biology. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Determination of Rn-222 Flux from Soils Based on Pb-210 and Ra-226 Disequilibrium | Provide a measure of the long-term radon flux in a range of geographical and geologic terrains as seen in the Pb-210 and Ra-226 disequilibrium in soil profiles. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Mechanisms of Mutagenesis by Alpha Particles and X-Rays in Human Cells | Define in precise molecular terms the nature of cell injury from radon exposure, in order to relate this to major health effects such as malignant transformation. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Growth Factors and Receptors in Radiation Carcinogenesis | Examine the involvement of growth factors and their receptors in radiation-induced carcinogenesis of the lung and provide molecular and cellular understanding of the mechanisms of radon-induced lung tumors in animals. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

U.S. DEPARTMENT OF ENERGY

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|------------------------------------------------|
| Chemical and Physical Processes Associated with Radon Distribution and Effects | Obtain required data for assessing the mechanisms governing the distribution, fate and pathways of entry into biological systems, as well as the ultimate hazards associated with radon progeny and their secondary reaction products. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Investigation of the Relation Between Aeroradiometric Bi-214 Signatures and Soil Radioactivity, Radium and Radon Content | Investigate the relationship between aerial gamma-ray measurements and the concentrations of radon in soil gas. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Investigation of the Geology and Geochemistry of Radon in Shear Zones | Develop thermodynamic geochemical models using geological and chemical analyses of radionuclides to understand and predict the concentration of uranium and radon in shear zones. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Early Lung Cancer Detection in Uranium Miners with Abnormal Sputum Cytology | Routinely examine cells from the sputum of uranium miners with the intent of identifying early lung cancers that can be treated with surgery and/or radiation. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Yields of Biologically Significant Damage Produced in Mammalian DNA by Irradiation Associated with Radon Decay | Determine the difference between the damage produced in DNA by α -particles and by low-LET radiation. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Radiation Dose and Injury to Critical Cells of the Respiratory Tract from Inhaled Radon | Provide improved knowledge of the types and locations of cells lining the airways that are irradiated by inhaled radon progeny to enable an improved dose estimation to be made for cells that may subsequently produce lung cancer. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|------------------------------------------------|
| Radon-Induced DNA Damage and Cell Transformation in Respiratory Epithelial Cells | Determine the direct effects of radon progeny and other high-LET radiation on respiratory epithelial cells compared to the effects of low-LET radiation and investigate the mechanisms of radiation carcinogenesis. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Deposition of Radon and Radon Progeny in the Respiratory Tract | Determine the deposition sites of inhaled radon progeny in the respiratory tract of people and quantify fractional deposition at these sites for different modes of breathing, body sizes, and aerosol characteristics. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Biological Significance of Radon-Induced Aneuploidy in Progenitor Cells of the Respiratory Tract | Determine whether radon and radon progeny induce cell-type specific aneuploid and chromosomal aberrations in the respiratory epithelium. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Dynamics of Radon Progeny Interactions with Indoor Aerosols | Develop an improved understanding of the complex interactions between radon progeny and other aerosols typically found indoors in homes and buildings. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Carcinogenic Effects of Alpha-Particle Radiation on Tracheal Cells | Determine the dose-response relationships of the induction of neoplastic transformation by X-rays, fission neutrons, and alpha particles. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Lung Cancer Risks from Radon Daughters in Domestic Environments | Determine whether the presence of radon progeny in the domestic environment measurably increases the risk of cancer for females in the general population. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
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| Comparative Hazards of Radon and Thoron in Indoor Air | Improve dosimetric estimate for internally deposited or in growing members of the Rn-222 and Rn-220 chains and gain a better understanding of the relative contributions of radon and thoron in indoor air to doses to radiosensitive tissues. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Microdosimetry of Radon Daughters | Develop more precise methods for calculating the radiation dose cells and cell nuclei from radon and radon daughter products. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Mechanisms of Radiation Damage to DNA from Radon Daughters | Understand the early physical and chemical changes produced in tissue by energetic alpha particles. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Repair of Alpha-Ray-Induced Cytogenetic Damage | Determine if low doses of X-rays are able to induce an adaptive response in human lymphocytes that makes them less susceptible to the induction of chromosome aberrations produced by densely ionizing α -particles from radon. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Determination of the Cell Distribution and Mucous Thickness in the Airways of the Lung for Modeling Injury due to Inhaled Radon and Radon Daughters | Determine the target regions for the inhaled pollutant as well as the sensitivity of specific cells located in the target regions to assess the effects of radon and radon progeny on the lungs. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Lung Cancer in Uranium Miners: A Tissue Resource | Develop a tissue resource of lung cancer cases from radon-exposed uranium miners and comparison cases from non-uranium miners. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Lung Cancer Epidemiology in New Mexico Uranium Miners | Assess the health effects of exposure to radon decay products in a cohort of 3500 New Mexico uranium miners. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|------------------------------------------------|
| Initiation, Promotion, Initiation Experiments with Radon and Cigarette Smoke: Lung Tumors in Rats | Analyze the large experimental data sets accumulated on lung tumors in rats exposed to radon. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Indoor Radon, Thoron and Related Aerosols | Investigate the environment factors and physical mechanisms that control indoor radon, thoron, progeny, and aerosol concentrations in real-world situations. Characterize those factors most significant in terms of the impact on human health. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Mechanisms of Radon Injury | Conduct dosimetric, molecular, cellular and whole-animal research relevant to the toxicology of radon exposures to provide an understanding of how radon exposures cause lung tumors in animals and aid in developing predictive models for humans. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Chromosome Damage in the 1 Rad Region: Cytogenetic Detection Following Ultra-Low Doses and Dose Rates | Measure damage to chromosomes of normal human cells resulting from exposure to radon-like radiations. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Radon Transport Modeling in Soils | Construct, validate, and apply a comprehensive computer-based model (Rn3D) of radon transport within soils and from soils into structures and the atmospheric environment. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Energy Deposition and Radiation Quality of Radon and Radon Daughters | Create a quantitative description at the micrometer and nanometer level of the physical interactions of the alpha particles from radon and its daughters with the cells at risk in the lung and bronchial epithelium. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|------------------------------------------------|
| Characterization of the Radon Source in Southeastern United States | Gain greater insight into the factors that determine radon availability in an environment characteristic of the Southeastern Coastal Plan and develop models to relate a number of different soil characteristics and other critical properties to radon transport and availability. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Regional Aerosol Deposition in Human Upper Airways | Elucidate important factors which influence overall and local deposition of aerosols in the human airways above the trachea. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Analysis of DNA Damage and Mutation Induced by Radon Daughter Products | Address questions concerning the types of DNA lesions induced and cellular processes involved in radon mutagenesis and carcinogenesis as well as the modifying influence of various physical and cellular factors. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Basics Studies of Radon and Related Po and Pb Isotopes | Elucidate the fundamental processes which govern the charge state, the clustering and the transport of the Pb, Po, and Bi Isotopes resulting from the decay of radon. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Mutations in Shuttle Plasmids | Determine the yield and spectrum of mutations induced by α -particles and X-rays in human cells; identify hot-spots for mutations in a target gene of the shuttle plasmid and correlate these with structural features of the DNA sequence; and investigate the effects of various factors on the yield and spectrum of mutations. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
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| Measurement and Apportionment of Radon Source Terms for Modeling Indoor Environments | Quantify mechanisms for radon entry into homes of different types and determine the fraction of indoor radon attributable to each source, and model and calculate the dose to cells in the human and animal tracheobronchial tree that is pertinent to the induction of bronchogenic carcinoma from inhaled radon daughters. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Particle Deposition in Human and Canine Tracheobronchial Casts | Measure deposition patterns and efficiencies of aerosol particles within realistic, single-pathway, physical models of the tracheobronchial airways of humans and experimental animals over a range of particle sizes for a variety of respiratory modes and rates. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Mutagenicity of Radon and Radon Daughters | Investigate the dose-response relationship with regard to the lethal and mutagenic effects of exposure of cells to radon and its decay products. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Biological Effectiveness of Radon Alpha Particles: A Microbeam Study of Dose Rate Effects | Characterize the response of mammalian cells exposed to low doses of alpha particle radiation at low dose rates. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Development and Field Testing of a System for Determination of Ultrafine Activity Particle Size Distribution and Working Levels | Construct and field test a continuous monitoring system that would provide information on both the size and charge distributions of the ultrafine size range particles. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Cellular Morphometry of the Bronchi of Human and Dog Lungs | Quantify the cells at risk for radon induced cancer in the lining of the large air passageways of the human lung. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|------------------------------------------------|
| Cellular Mechanisms of Radon-Induced Lung Tissue Injury <i>In Vitro</i> | Elucidate basic cellular mechanisms of injury to pulmonary tissue arising from exposure to the gaseous radionuclide radon (Rn-222) and its daughters. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Unifying Theory of Radon Generation and Transport in Porous Media | Develop a general, unified theory of radon emanation and transport and implement it in a computer code for application in routine and specialized field studies and research programs. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Modeling Transport of Radon and Thoron Through Porous Materials | Understand the transport of radon isotopes through porous media and their release to the atmosphere of the indoor and outdoor environments. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Study of Chromosome Aberrations | Obtain hit size effectiveness functions for chromosome aberrations in order to evaluate absolute risk in radiation fields of mixed linear energy transfer. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Investigation of Radon Entry and Effectiveness of Mitigation Measures | Gain better understanding of radon transport and factors affecting mitigation efficiency, focusing on investigating availability and transport near occupied houses. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Laser Measurements of Pb-210 | Develop a sensitive, accurate analytical method that will aid in performing a definitive study of the correlation of Pb-210 levels and Pb-210:Pb-208 ratios in human tissues with radon exposure. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Investigation of Radon Release and Mobility in the Subsurface Environment | Characterize and quantify the influence of environmental factors on the mobility of radon in the subsurface and the soil/air interface. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|------------------------------------------------|
| Radon Dynamics Indoors | Investigate the behavior of radon and radon progeny in occupied houses under real world conditions to better understand human exposure to radon and its radioactive decay products. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Dynamic Behavior of Radon and its Daughters | Study the dynamic behavior of radon progeny in controlled laboratory environments. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Fundamental Studies of Radon Release from Soil Constituents and Natural Soil | Develop a comprehensive picture of the chemical and physical relationships pertaining to the loci of the radon precursors on or within the soil grains, and relate this knowledge to the geologic history of the soil. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |
| Po-210 as Long-Term Integrating Radon Indicator in the Indoor Environment | Identify situations in which the surface activity of Po-210 can be used as a long-term indicator of lung cancer risk from past or future radon exposures. | Ongoing. | DOE/ER/OHER | Susan Rose (301) 353-5355 (FTS) 233-5355 |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------|------------------------------------------------------|
| CIAQ Co-chair | Coordinate Federal research and policy on indoor air quality issues. | Ongoing. | DHHS/CDC/NIOSH | Phillip Bierbaum (513) 841-4321 (FTS) 684-4321 |
| General Indoor Air Quality Information | Answer inquiries on indoor air quality information or any occupational safety and health issue. | Ongoing. | DHHS/CDC/NIOSH | (800) 356-4674 |
| Indoor Air Quality Investigations | Provide site investigations or technical advice to solve indoor air quality problems. | Ongoing. | DHHS/CDC/NIOSH | David Sundin (513) 841-4382 (FTS) 684-4382 |
| Epidemiologic Study of Indoor Air Quality | Address relationships between indoor air quality and worker symptoms by comparing risks between individuals in poorly ventilated versus well ventilated buildings. | Ongoing. | DHHS/CDC/NIOSH | David Brown (513) 841-4203 (FTS) 684-4203 |
| Analytical Techniques for Indoor Air Contaminants | Research and information on existing analytical methods. | Ongoing. | DHHS/CDC/NIOSH | Peter Eller (513) 841-4321 (FTS) 684-4321 |
| Method for Sampling and Analysis of Indoor Air for Organic Compounds | Detect and identify volatile organic compounds at part per billion levels in a single sample. | Ongoing. | DHHS/CDC/NIOSH | Gene Fernecey (513) 841-4402 (FTS) 684-4402 |
| Methods for Evaluating Indoor Air Ventilation Systems | Develop effective ventilation system measurement tools for indoor air quality investigations. | Ongoing. | DHHS/CDC/NIOSH | Robert Hughes (513) 841-4289 (FTS) 684-4289 |
| Library of Congress Indoor Air Quality Study (w/EPA, NIOSH, and Yale University) | Conduct an epidemiologic/environmental investigation at the Library of Congress. | Report in preparation. | DHHS/CDC/NIOSH | Rick Gorman (513) 841-4382 (FTS) 684-4382 |
| Development of Survey Assessment Instrument for Indoor Air Quality | Develop reliable and valid psychometric measures for use across a wide variety of occupations including workers in non-industrial workplaces. | Ongoing. | DHHS/CDC/NIOSH | Joe Hurrell (513) 533-8293 (FTS) 684-8293 |
| Indoor Air Quality Training Initiative | Develop up-to-date training modules for indoor air quality investigations. | Ongoing. | DHHS/CDC/NIOSH | Pete Reritos (513) 533-8251 (FTS) 684-8251 |

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------|--------------------------------------------------------------------------|
| Towards Smoke Free Workplace in Rhode Island | Cooperate with State of Rhode Island in study of biochemical markers of tobacco smoke in a work setting. | Report in preparation. | DHHS/CDC/CEHC | Ruth Etzel (404) 488-4682 (FTS) 236-4682 |
| Measurement of Biochemical Indicators of Tobacco Exposure | Develop reliable tests for cotinine and other analytes which reflect use of tobacco smoke to examine effects of tobacco smoke exposure. | Ongoing. | DHHS/CDC/CEHC | Ruth Etzel (404) 488-4682 (FTS) 236-4682 |
| State Services and Public Information Services on Indoor Air Pollution | Provide information resource for State health departments and members of the public requesting information on the health effects of air pollutants. | Ongoing. | DHHS/CDC/CEHC | Ruth Etzel (404) 488-4682 (FTS) 236-4682 |
| Mercury Exposure from Interior Latex Paint | Study exposure to mercury vapor in residents of recently painted homes. | Ongoing. | DHHS/CDC/CEHC | Ruth Etzel (404) 488-4682 (FTS) 236-4682 |
| Tobacco Smoke | Provide technical and public information on environmental tobacco smoke. | Ongoing. | DHHS/CDC/CCDPPH/ OSH | Technical Information Center, OSH (301) 443-1575 (FTS) 443-1575 |
| Health Statistics | Collect, analyze, and disseminate health data from national surveys. | Ongoing. | DHHS/CDC/NCHS | Diane Wagener (301) 436-7032 (FTS) 436-7032 |
| Health Effects from Exposure to Selected Indoor/Outdoor Pollutants (24 Cities Study) | Conduct epidemiologic studies of SO ₂ , respirable particulates, and acid aerosols on health. | Ongoing. | DHHS/NIH/NIEHS | James Fouts (919) 541-3506 (FTS) 629-3506 |
| Inhalation Toxicity Studies | Develop biological markers for recent exposures to SO ₂ , NO ₂ , and O ₃ . | Ongoing. | DHHS/NIH/NIEHS | James Fouts (919) 541-3506 (FTS) 629-3506 |
| Pulmonary Pathobiology Studies | Explore mechanisms of particle and fiber toxicology with respiratory tract. | Ongoing. | DHHS/NIH/NIEHS | James Fouts (919) 541-3506 (FTS) 629-3506 |
| Respiratory Disease and Aerosol Physiology | Develop methods to evaluate risks to human respiratory health from interactive air pollutant gases. | Ongoing. | DHHS/NIH/NIEHS | James Fouts (919) 541-3506 (FTS) 629-3506 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------------------------------------------------|
| Health Effects of Passive Exposure to Cigarette Smoke | Evaluate mechanisms and effects of regional deposition of inhaled particles. | Ongoing. | DHHS/NIH/NIEHS | James Fouts (919) 541-3506 (FTS) 629-3506 |
| Identification of Basidiomycete Allergens in Mold Asthma | Identify allergens that cause mold asthma. | Ongoing. | DHHS/NIH/NIAID | Patricia Gallahan (301) 496-6752 (FTS) 496-6752 |
| Role of Dust Mite, Cockroach, and Cat Allergens in Houses/Asthma | Evaluate role of selected biocontaminants in causing residential IAQ problems and asthma. | Ongoing. | DHHS/NIH/NIAID | Patricia Gallahan (301) 496-6752 (FTS) 496-6752 |
| Immunochemical Assay of Aeroallergens | Conduct immunochemical assays of aeroallergens. | Ongoing. | DHHS/NIH/NIAID | Patricia Gallahan (301) 496-6752 (FTS) 496-6752 |
| Immunotherapy in Mite Sensitive Formation | Evaluate immunotherapy in formation of mite sensitivity. | Ongoing. | DHHS/NIH/NIAID | Patricia Gallahan (301) 496-6752 (FTS) 496-6752 |
| Legionella-Induced Cytokine Formation | Increase understanding of legionella caused disease. | Ongoing. | DHHS/NIH/NIAID | Patricia Gallahan (301) 496-6752 (FTS) 496-6752 |
| Genetic Approaches to Pathogenesis | Study role of genetics in disease. | Ongoing. | DHHS/NIH/NIAID | Patricia Gallahan (301) 496-6752 (FTS) 496-6752 |
| Immune Response to a Pulmonary Pathogen | Study immune response to pulmonary pathogens. | Ongoing. | DHHS/NIH/NIAID | Patricia Gallahan (301) 496-6752 (FTS) 496-6752 |
| Transplacental Carcinogenicity of NNK | Study the possible transplacental carcinogenicity of NNK. | Ongoing. | DHHS/NIH/NCI | Lucy Anderson (301) 846-5600 (FTS) 978-5600 |
| Study of Thyroid Cancer in High Radiation Areas in China | Study the incidence of thyroid cancer in high radiation areas in China. | Ongoing. | DHHS/NIH/NCI | John Boice (301) 496-6600 (FTS) 496-6600 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|-----------------------------------------------------|
| Epidemiology of Lung Cancer in Chinese Tin Employees | Perform a historical cohort study on tin company workers and an incident case control study of lung cancer among company employees and residents of Gejui City. | Ongoing. | DHHS/NIH/NCI | Jay Lubin (301) 496-3356 (FTS) 496-3356 |
| Chronic Disease of the Airways: Prospective Evaluation of Airways Reactivity | Evaluate airways reactivity in regard to chronic disease outcomes. | Ongoing. | DHHS/NIH/NHLBI | Carol Vriem (301) 496-7208 (FTS) 496-7208 |
| Chronic Disease of the Airways: Pediatric Airway Obstructive Disease | Evaluate airway obstructive disease in children. | Ongoing. | DHHS/NIH/NHLBI | Carol Vriem (301) 496-7208 (FTS) 496-7208 |
| Respiratory Disorders of Neonates and Children | Evaluate respiratory disorders in neonates and children. | Ongoing. | DHHS/NIH/NHLBI | Carol Vriem (301) 496-7208 (FTS) 496-7208 |
| Reproductive Disorders Associated with Occupational Exposure to Nitrous Oxide | Evaluate occupational exposures to nitrous oxide. | Ongoing. | DHHS/NIH/NIDR | Kenneth Lynn (301) 496-7220 (FTS) 496-7220 |
| Technical Assistance for Federal Agencies | Provide site investigations or technical advice on indoor air quality problems to Federal agencies. | Ongoing. | DHHS/HRSA/DFOBHS | James Felsen (301) 443-2257 (FTS) 443-2257 |
| Contamination Related to Hazardous Wastes | Provide assistance and advice on indoor air contaminants exposures related to hazardous waste sites. | Ongoing. | DHHS/ASTDR | Frank Mithcell (404) 488-4853 (FTS) 236-4853 |
| RADON ACTIVITIES | | | | |
| Evaluation of Radon/Radon Progeny Exposures in Radon Mitigators | Determine the factors involved in exposure to radon during mitigation activities. | Ongoing. | DHHS/CDC/NIOSH | Tom Bloom (513) 841-4314 (FTS) 684-4314 |
| Consultations with States and Other Organizations | Respond to inquiries on health aspects of radon exposure. | Ongoing. | DHHS/CDC/CEHC | Christie Eheman (404) 488-4682 (FTS) 236-4682 |

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| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------|------------------------------------------------------|
| National Park Service Indoor Radon Program (w/DOI) | Assist in the design and implementation of the National Park Service indoor radon sampling program. | Ongoing. | DHHS/CDC/CEHIC | Christie Ehemann (404) 488-4682 (FTS) 236-4682 |
| Radon Progeny and Lung Cancer | Investigate the relationship between indoor radon exposure and lung cancer | Ongoing. | DHHS/NIH/NIEHS | Gwen Collman (919) 541-4980 (FTS) 629-4980 |
| Indoor Radon Pollution and Cigarette Smoke in Etiology of Lung Cancer | Epidemiologic studies on radon exposure and lung cancer risk. | Ongoing. | DHHS/NIH/NIEHS | James Fouts (919) 541-3506 (FTS) 629-3506 |
| Lung Cancer Among Non-smoking Women with Residential Exposure to Radon Study | Compare estimates of lung cancer risk (per pCi/l) in non-smoking Missouri women to corresponding estimates on miners. | Ongoing. | DHHS/NIH/NCI | Michael Alavanja (301) 496-1611 (FTS) 496-1611 |
| Household Radon Exposure Among Women Admitted to Hospitals Study | Obtain measurements of radon exposure for each subject, estimate lung cancer risk per pCi/l of concentration, and compare with corresponding estimates on miners. | Ongoing. | DHHS/NIH/NCI | Zdenek Hrubec (301) 496-6600 (FTS) 496-6600 |
| Lung Cancer Among Women in China Exposed to Indoor Radon and Other Pollutants Study | Obtain measurements of radon exposure for each subject, and estimate lung cancer risk per pCi/l of concentration. | Ongoing. | DHHS/NIH/NCI | John Boice (301) 496-6600 (FTS) 496-6600 |
| Lung Cancer Among Women in New Jersey Study | Evaluate radon as a potential risk factor by monitoring radon levels in the homes of persons who developed lung cancer and in the homes of others who do not have the disease. | Ongoing. | DHHS/NIH/NCI | Zdenek Hrubec (301) 496-6600 (FTS) 496-6600 |

INDOOR AIR ACTIVITIES WITHIN THE BONNEVILLE POWER ADMINISTRATION

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | BPA | Charles Alton (503) 230-5878 (FTS) 429-5878 |
| Ventilation Research Project | Investigate effects of mechanical ventilation systems on air flows inside residential buildings and between the structure and the outside environment. | First stage field data collected. Report available: late 1990. | BPA | Mark Jackson (503) 230-5475 (FTS) 429-5475 |
| Northwest Residential Infiltration Study (NORIS) | Determine infiltration rates in homes constructed according to current building practices and in homes built according to Model Conservation Standards (MCS). Investigate relationship between fan pressurization and perfluorocarbon tracer (PFT) measurements. | Final report available. | BPA | Mark Jackson (503) 230-5475 (FTS) 429-5475 |
| Residential Ventilation System Design and Analysis (RCDP II) | Test innovative multi-family ventilation systems. Provide designs to builders and developers. Evaluate the effectiveness of single-family ventilation systems in existing Super Good Cents houses. | Up to 6 innovative systems will be installed in 1990-1991. Testing of single-family systems underway. Reports available: 1991. | BPA | Mark Jackson (503) 230-5475 (FTS) 429-5475 |
| Dissemination of Technical Reports | Increase understanding of indoor air quality-related topics. | Reports available on diverse topics including: general IAQ, air to air heat exchangers, formaldehyde, radon, and ventilation. | BPA | Jill Lewis (503) 230-7334 (FTS) 429-7334 |
| RADON ACTIVITIES | | | | |
| Radon Mitigation Expert System | Develop an expert system to assist mitigators in the selection and design of residential radon mitigation systems. | New. | BPA | Chuck Eastwood (503) 230-4992 (FTS) 429-4992 |
| Subslab Gravel Study | Determine the influence of subslab aggregate permeability on the performance of subslab ventilation systems. | New. | BPA | Chuck Eastwood (503) 230-4992 (FTS) 429-4992 |

INDOOR AIR ACTIVITIES WITHIN THE GENERAL SERVICES ADMINISTRATION

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------|-----------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | GSA | Roberta Kaplan (202) 501-1487 (FTS) 241-1487 |
| Indoor Air Quality Policy and Guidelines for GSA-Owned and Controlled Buildings | Maintaining acceptable IAQ throughout GSA space. | Implemented: Fall 1988. Over 1,000 assessments conducted. | GSA | Roberta Kaplan (202) 501-1487 (FTS) 241-1487 |
| Thermal and Environmental Evaluation of Advanced Technology Office Buildings | Validate the use of diagnostic techniques for evaluating building design and performance features including IAQ. | Ongoing. | GSA | Dave Eakin (202) 501-1726 (FTS) 241-1726 |
| Development of Protocol to Determine Friability of Sprayed-on-Asbestos-Containing Surfacing Materials (w/National Bureau of Standards) | Develop mechanical technique or device which will provide a consistent measure of the friable nature of existing sprayed-on-asbestos-fireproofing. | Completed. | GSA | Warren Friedman (202) 501-1258 (FTS) 241-1258 |
| Asbestos Guidance in GSA Facilities | Develop easily used set of forms and instructions on asbestos operations and maintenance. Intended for GSA building managers; adaptable by other building owners. | Issuance: Fall 1990. | GSA | Warren Friedman (202) 501-1258 (FTS) 241-1258 |

INDOOR AIR ACTIVITIES WITHIN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | NASA | Ray Gilbert (703) 557-8163 (FTS) 557-8163 |
| Study on House Plants and Air Quality | Determine mechanisms by which plants remove chemicals from air. Evaluate capacity and efficiency of removal. | Ongoing. | NASA/John C. Stennis Space Center | Anne Johnson (601) 688-3155 (FTS) 494-3155 |
| Offgassing of Materials for Spacecraft Applications | Determine acceptability of materials for spacecraft use. | Maintain data in computer file called MAPTIS. Publish handbook, <i>Materials Selection List for Space Hardware Systems</i> annually. Research ongoing. | NASA/Marshall Space Craft Flight Center | C.F. Key (205) 544-2487 (FTS) 544-2487 |

INDOOR AIR ACTIVITIES WITHIN THE TENNESSEE VALLEY AUTHORITY

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | TVA | Robert S. Rainey (205) 386-2314 (No FTS) |
| Chattanooga Indoor VOC and NO ₂ Study | Examine short-term concentrations of VOCs and NO ₂ in 7 residences and 3 public buildings. | Completed: report available. | TVA | William J. Parkhurst (205) 386-2793 (No FTS) |
| NO ₂ Concentrations in 5 Chattanooga, TN Public Housing Developments | Examine relationships between NO ₂ and various appliance types and weatherization measure in 200 homes. | Completed: report available. | TVA | William J. Parkhurst (205) 386-2793 (No FTS) |
| NO ₂ Intervention Study in Public Housing Developments | Examine influence of gas appliance inspection and maintenance program on NO ₂ concentrations in 30 public housing residences. | Completed: report available. | TVA | William J. Parkhurst (205) 386-2793 (No FTS) |
| Public Outreach | Develop and distribute IAQ materials to public, provide toll-free Citizen Action Line, provide speakers for meetings. | Ongoing. | TVA | Robert S. Rainey (205) 386-2314 (No FTS) Barry L. Barnard (205) 386-2792 (No FTS) |
| Industrial Hygiene Studies | Monitor and assess IAQ in buildings and structures occupied by TVA. | TVA Occupational Hygiene Department leads project. Work in progress. | TVA | Robert S. Rainey (205) 386-2314 (No FTS) John McFeters (202) 386-2312 (No FTS) |
| RADON ACTIVITIES | | | | |
| Implementation of Indoor Radon Abatement Act | Conduct radon measurements within TVA buildings. | Report submitted to EPA. | TVA | Ron Maxwell (205) 386-2767 (No FTS) |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF COMMERCE (NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY)

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | DOC/NIST | James Hill (301) 975-5851 (FTS) 879-5851 |
| Indoor Air Pollution and Building Airflow Models | Develop generalized simulation programs that account for air movement and contaminant dispersal within buildings due to generation, dilution, reaction, adsorption and other mechanisms. | Contaminant adsorption models have been developed. NBSAVIS and CONTAM88 available for multizone airflow and contaminant modeling. Professional series of CONTAM to be available: end of FY 90. | DOC/NIST | Andy Persily (301) 975-6418 (FTS) 879-6418 |
| Three-Dimensional Modeling of Room Air Motion | Development and application of computer models to predict three-dimensional velocity fields and contaminant concentrations within ventilated spaces. Use of these computer codes to produce information for ventilation system design. | Computer model developed and being applied to various office configurations. Validation efforts in progress. | DOC/NIST | Jin Fang (301) 975-6417 (FTS) 879-6417 |
| Ventilation and Air Quality in Large Buildings | Develop test methods and procedures for studying air exchange characteristics, pollutant levels and their relationship in large buildings. | Long-term monitoring of ventilation and contaminant levels in two new federal office buildings. Ventilation effectiveness measurement techniques for mechanically ventilated office buildings under development. | DOC/NIST | Andy Persily (301) 975-6418 (FTS) 879-6418 |
| Efficiency of Gaseous Contaminant Removal Devices | Develop a test method for determining the efficiency and capacity of gaseous pollutant removal equipment in HVAC systems. | Draft standard of laboratory test method being prepared. | DOC/NIST | Andy Persily (301) 975-6418 (FTS) 879-6418 |
| NIST Measurement Standards Program | Upgrade the radon measurement system. Provide transfer calibration standards services. | Ongoing. | DOC/NIST | Ron Colle (301) 975-5527 (FTS) 975-5527 |

U.S. DEPARTMENT OF COMMERCE

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------|------------------------------------------------|
| Energy Disposition and Radiation Quality of Radon and Radon Daughters (w/DOE) | Create a quantitative micro-dosimetric description of the interaction of alpha particles from radon and its daughters with the cells at risk in the lung and adjacent areas. | New. | DOC/NIST and DOE | Susan Rose (301) 353-5355 (FTS) 353-5355 |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF DEFENSE

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | DOD/DON | Daniel Reinhard (202) 692-3287 (No FTS) |
| SBS Complaint Investigations | Provide guidance to field support teams on conducting indoor air quality investigations at Air Force facilities. | Guidance document completed: 4/87. | DOD/USAF/OEH | Capt. Frank Liebhaber (512) 536-3214 (No FTS) Major Lance Edwards (202) 767-1739 (No FTS) |
| Data Repository of IAQ Investigations | To assess magnitude of IAQ problems at Air Force facilities. | Reports to be issued. | DOD/USAF and Office of the Surgeon General | Major Lance Edwards (202) 767-1739 (No FTS) |
| RADON ACTIVITIES | | | | |
| U.S. Army Radon Reduction Program | Aid in the identification of buildings with elevated radon levels so that remedial actions may be taken. | New. | DOD/DOA | Emery Lazar (202) 272-8693 (No FTS) |
| Navy Radon Assessment and Mitigation Program | Screen Navy and Marine Corps installations for structures with elevated radon levels and reduce elevated levels, where found, to below 4 pCi/l. | Initial screening phase to be completed: 10/90. Detailed assessment to begin: 1/91. Some mitigation underway. | DOD/DON | Capt. Karl Mendenhall (202) 692-5573 (No FTS) |
| U.S. Air Force Radon Assessment and Mitigation Program | Identify, evaluate and mitigate potential sources of radon which could pose unacceptable risks to the Air Force populace worldwide. | Ongoing. Initial screening phase was completed: 3/88. Detailed assessment is ongoing with some mitigation underway. | DOD/USAF | Jayant Shah (202) 767-6245 (No FTS) |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | HUD | James Stimpson (202) 708-6230 (FTS) 458-4230 |
| RADON ACTIVITIES | | | | |
| Development of Radon Policy for HUD Program | Determine HUD/FHA and Public and Indian Housing policies to handle radon issues. | Policy called for in McKinney Amendments Act is in internal clearance. | HUD | Richard Broun (202) 708-2894 (FTS) 458-2894 |
| Development of Memorandum of Understanding with EPA | Provide mechanism for coordinating radon activities. | MOU executed by HUD and EPA: 7/89. | HUD and EPA | Dick Alexander (202) 708-4225 (FTS) 458-4225 |
| Assistance in Development of a National Policy Regarding Radon Exposure | Provide scientific and technical analysis of radiation research, including radon gas, and develop a basis for Federal consensus on environmental radon exposure. | Ongoing participation in CIRRPC studies, such as "Federal Programs on Indoor Radon, 4/88." | HUD and CIRRPC | Dick Alexander (202) 708-4225 (FTS) 458-4225 |
| Radon Exposure in Multi-Family Housing | Test for radon exposure in four multi-story buildings in Washington, D.C. | MOU with EPA executed; work plan ready for contract. | HUD and EPA | Conrad Arnolds (202) 708-1528 (FTS) 458-1528 |
| OTHER ACTIVITIES | | | | |
| Moisture Control in Manufactured Housing | Identify effects of indoor humidity on walls and evaluate ventilation devices for humidity control. | Testing on walls and ventilation devices in six manufactured houses in Madison, WI to be completed: Spring 1991. Report to be completed: Fall 1991. | HUD and USDA | Bill Freeborne (202) 708-1528 (FTS) 458-1528 |
| LEAD-BASED PAINT ACTIVITIES | | | | |
| Memorandum of Understanding between HUD and EPA | Define the responsibilities of HUD and EPA on research and demonstration activities responding to legislative requirements on lead-based paint. | MOU executed: 4/89. | HUD and EPA | Ellis Goldman (202) 708-1528 (FTS) 458-1528 |
| Lead-Based Paint Abatement Demonstration in FHA Housing | Demonstrate and determine the cost-effectiveness of various abatement strategies in HUD-owned housing. | 173 properties in five metropolitan areas have been abated; analysis of data is underway. Report to Congress now scheduled for completion: 6/91. | HUD | Ellis Goldman (202) 708-1528 (FTS) 458-1528 |

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------|
| Lead-Based Paint Abatement Demonstration in Public Housing | Demonstrate abatement strategies in public housing with special attention to transfer of dust between units. | Demonstrations will take place in three public housing agencies. Contracts awarded for demonstration support. | HUD | Conrad Arnolts (202) 708-1528 (FTS) 458-1528 |
| Spot Tests for Lead-Based Paint (w/DOC/NIST) | Research new spot tests for lead-based paint to make identification cheaper and easier. | Project is now underway. | HUD and NIST | Dorothy Allen (202) 708-0450 (FTS) 458-0450 |
| National Hazard Estimate and Comprehensive and Workable Plan for Private Housing | Develop an estimate of the national hazard from lead-based paint; prepare a comprehensive and workable plan for the prompt and cost-effective identification and abatement of lead-based paint in all privately owned housing in the United States. | Field survey work complete; report in progress. Report to be submitted to Congress: 9/90. | HUD | Stevenson Weitz (202) 708-4370 (FTS) 458-4370 |
| Comprehensive and Workable Plan for Public Housing | Develop a comprehensive and workable plan for lead-based paint abatement in public housing. | Field survey work completed. Cost data to be obtained from the abatement demonstration in public housing. Report to Congress scheduled for completion: 6/91. | HUD | Stevenson Weitz (202) 708-4370 (FTS) 458-4370 |
| In-Place Management (Interim Containment) Strategy for Public Housing | Develop a strategy for managing potential lead-based paint hazards for properties which are not scheduled for comprehensive modernization. | Draft strategy is being reviewed by a number of PHAs and others. | HUD | William Wisner (202) 708-4370 (FTS) 458-4370 |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF THE INTERIOR

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|------------------------------------------------------|
| RADON ACTIVITIES | | | | |
| Indoor Radon Program (w/DHHS) | Measure radon in all residences and office buildings owned by the National Park Service, and mitigate buildings to "safe" levels. | Ongoing. | DOI/NPS | Alan Kingsbury (202) 343-7090 (FTS) 343-7090 |
| Radon Exposure Assessment of Workers Who Work in Caves (w/DHHS) | Assess past and current radon exposure of employees who work in caves. | Ongoing. | DOI/NPS | Christic Ehemann (404) 488-4682 (FTS) 236-4682 |
| Mobility, Transport and Fate of Naturally Occurring Radionuclides in Ground Water | Determine factors controlling radionuclide transport and fate along groundwater flow paths, and define mechanisms that release radionuclides to ground water and characterize spatial variation of radionuclide concentrations. | Ongoing. | DOI/USGS | Otto Zepceca (609) 771-3900 (No FTS) |
| Natural Radioactivity in Ground Water of the Kirkwood-Cohansey Aquifer System | Define occurrence and distribution of radionuclides in ground water, identify relation between radionuclide activities and other chemical constituents, define source of radioactivity in ground water chemistry and radionuclide content along flow paths. | Ongoing. | DOI/USGS | Otto Zepceca (609) 771-3900 (No FTS) |
| Investigation of the Geology and Geochemistry of Radon in Shear Zones (w/DOE) | Investigate radon in major shear zones along the east coast of the U.S. | Ongoing. | DOI/USGS | Linda Gunderson (703) 648-6427 (FTS) 959-6427 |
| Relationships Between Aeroradiometric Measurements of Bi-214 and Soil Radioactivity, Ra, and Rn Content (w/DOE) | Correlate between aeroradiometric surveys using a radon decay product, the radium concentration in soil, and the radon concentration in soil gas. | Ongoing. | DOI/USGS | Joseph Duval (703) 648-6391 (FTS) 959-6391 |
| National Equivalent Uranium Map Production (w/EPA) | Reprocess U.S. DOE National Uranium Resource Evaluation (NURE) aerial radiometric data. | Ongoing. | DOI/USGS and EPA | Tom Peake (202) 475-9605 (FTS) 475-9605 |

U.S. DEPARTMENT OF THE INTERIOR

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|------------------------------------------------------|--------------------------------------------------------------|----------|-----------------------|-----------------------------------------------|
| Technical Assistance for State Radon Surveys (w/EPA) | Provide geological assessments of statewide radon potential. | Ongoing. | DOI/USGS and EPA | Tom Peake (202) 475-9605 (FTS) 475-9605 |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF LABOR (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | DOL/OSHA | Al Abadir (202) 523-7056 (FTS) 523-7056 |
| Occupational Standards for Indoor Air Pollutants | Regulate levels of air pollutants in the industrial workplace. | Final rule for ethylene oxide: 4/6/88. Final rule stage for ethylene dibromide, cadmium, asbestos, and methylenedianiline. Proposed rule stage for 1,3-butadiene, glyco ethers, methylene chloride. | DOL/OSHA | Charles Adkins (202) 523-7075 (FTS) 523-7075 |
| Toxic Substances in Laboratories | Regulate levels of toxic substances in the laboratory. | Final rule: 1/90 (effective 5/90). | DOL/OSHA | Charles Adkins (202) 523-7075 (FTS) 523-7075 |
| Permissible Exposure Limit Update | Update occupational standards by adopting ACGIH Threshold Limit Values (TLVs) and NIOSH Recommended Exposure Limits (RELs). | Final rule: 1/89 (effective 3/89). | DOL/OSHA | Charles Adkins (202) 523-7075 (FTS) 523-7075 |
| Field Health Compliance Inspections | Protect health of American workers by inspecting exposure to hundreds of air contaminants. | Ongoing. | DOL/OSHA | Regional Administrators and Area Directors (throughout U.S.) |
| IAQ Chapter of OSHA Technical Manual | Investigate IAQ cases by OSHA compliance officers. | Compliance policy under review. | DOL/OSHA | Long Loo (202) 523-7056 (FTS) 523-7056 |
| IAQ Training Course | Assist Federal and State compliance officials in evaluating indoor air quality in non-industrial workplaces. | Ongoing. | DOL/OSHA | Zigmas Saduskas (312) 297-4810 (FTS) 353-2500 |
| Regulatory Review of Indoor Air Quality and Smoking | Consider whether OSHA should regulate smoking and indoor air quality. | Ongoing. | DOL/OSHA | Charles Adkins (202) 523-7075 (FTS) 523-7075 |
| Health Response Team Onsite Evaluation | Assist Federal and State Compliance Officials in conducting indoor air quality investigations in non-industrial workplaces. | Ongoing. | DOL/OSHA | Floyd Madsen (801) 524-5287 (FTS) 588-5287 |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF STATE

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------|-----------------------|----------------------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | DOS/Safety Office | Stephen Uman (202) 647-4302 (FTS) 647-4302 |
| State Indoor Air Quality Committee (SIAQ) | Coordinate activities of offices whose activities or operations affect the indoor air quality of DOS facilities. | Ongoing. | DOS/Safety Office | Stephen Uman Ken Doolan (202) 647-4302 (FTS) 647-4302 |
| RADON ACTIVITIES | | | | |
| Radon Assessment Advisory Group | Select a course of action for radon control program for overseas buildings and dwellings. | Ongoing. | DOS | Stephen Uman (202) 647-4302 (FTS) 647-4302 |

INDOOR AIR ACTIVITIES WITHIN THE U.S. DEPARTMENT OF TRANSPORTATION

| ISSUE/MAJOR ACTIVITY | PURPOSE | STATUS | LEAD AGENCY/OFFICE | CONTACT |
|----------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|
| CIAQ Member | Coordinate Federal research and policy on IAQ issues. | Ongoing. | DOT/OST/Environmental Division | Eugene Lehr (202) 366-4860 (FTS) 366-4860 |
| Airliner Cabin Air Quality | Examine air quality in cabins of commercial airlines. | Smoking is now banned on almost all domestic flights. Continuing study of cosmic radiation and carbon dioxide. Report issued: 2/90. | DOT/OST/Aviation Regulations and Coordination Division | Arnold Konheim (202) 366-4849 (FTS) 366-4849 |

INDOOR AIR QUALITY PUBLICATIONS AVAILABLE FROM FEDERAL AGENCIES

Publications listed below were issued as a general public information or technical assistance activity. They are intended to provide guidance to either the general public or some specific segment of the public. Activities that result in the publication of technical reports are listed and described under the sponsoring Federal agency earlier in this document.

| TITLE | DATE | LEAD AGENCY/OFFICE | CONTACT |
|-------|------|--------------------|---------|
|-------|------|--------------------|---------|

U.S. ENVIRONMENTAL PROTECTION AGENCY

The full address of the EPA Public Information Center is listed below. Those publications for which "PIC" is listed as the contact should be ordered from the EPA Publication Information Center. Also, many of the publications listed below are available from the EPA Regional Offices.

EPA Public Information Center (PIC)
401 M Street S.W. (PM-211B)
Washington, D.C. 20460
(202) 382-2080
(FTS) 382-2080

| | | | |
|----------------------------------------------------------------|-------------|------------------------|---------------------------------------------------------|
| <i>The Inside Story: A Guide to Indoor Air Quality</i> | 1988 | EPA/OAR/OAIAP (w/CPSC) | PIC |
| <i>Directory of State Indoor Air Contacts</i> | 1988 | EPA/OAR/OAIAP | |
| Fact Sheets: #3: <i>Ventilation and Air Quality in Offices</i> | 1990 (rev.) | OAIAP | |
| #4: <i>Sick Buildings</i> | 1990 (rev.) | | |
| #5: <i>Environmental Tobacco Smoke</i> | 1988 | | |
| #6: <i>Report to Congress on Indoor Air Quality</i> | 1989 | | |
| #7: <i>Residential Air Cleaners</i> | 1990 | | |
| <i>Residential Air-Cleaning Devices</i> | 1990 | EPA/OAR/OAIAP | |
| <i>Current Federal Indoor Air Activities</i> | 1990 | EPA/OAR/OAIAP | |
| <i>Asbestos in the Home: A Homeowner's Guide</i> | 1988 | EPA Region X | Mary Frances Briggs (202) 442-1255 (FTS) 399-1255 |
| <i>Health Effects of Wood Burning</i> | 1988 | EPA Region VIII | Chuck Stevens (303) 294-1111 (FTS) 330-1111 |

PUBLICATIONS AVAILABLE FROM FEDERAL AGENCIES

| TITLE | DATE | LEAD AGENCY/OFFICE | CONTACT |
|----------------------------------------------------------------------------------------------------------------------------|------|--------------------|----------------------------------------------------|
| Managing Asbestos in Place | 1990 | EPA/OPTS/OTS | Toxics Hotline (202) 554-1404 (FTS) 554-1404 |
| <i>Asbestos in Your Home</i> | 1990 | EPA, CPSC and ALA | |
| <i>ABCs of Asbestos in Schools</i> | 1989 | EPA/OPTS/OTS | |
| <i>Guidelines for Conducting the AHERA TEM Clearance Test to Determine the Completion of an Asbestos Abatement Project</i> | 1989 | EPA/OPTS/OTS | |
| <i>Assessing Asbestos Exposure in Public Buildings</i> | 1988 | EPA/OPTS/OTS | |
| <i>EPA Study of Asbestos-Containing Materials in Public Buildings</i> | 1988 | EPA/OPTS/OTS | |
| <i>Asbestos in Schools: A Guide to New Federal Requirements for Local Education Agencies</i> | 1988 | EPA/OPTS/OTS | |
| <i>A Guide to Respiratory Protection for the Asbestos Abatement Industry</i> | 1986 | EPA and NIOSH | |
| <i>Airborne Asbestos Health Assessment Update</i> | 1986 | EPA/OPTS/OTS | |
| <i>Guidance for Preventing Asbestos Disease Among Mechanics</i> | 1986 | EPA/OPTS/OTS | |
| <i>Guidance for Controlling Asbestos-Containing Materials in Buildings</i> | 1985 | EPA/OPTS/OTS | |
| <i>Asbestos in Buildings: Guidance for Service and Maintenance Personnel (in English and Spanish)</i> | 1985 | EPA/OPTS/OTS | |
| <i>Measuring Airborne Asbestos Following An Abatement Action</i> | 1985 | EPA/OPTS/OTS | |
| <i>Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials</i> | 1984 | EPA/OPTS/OTS | |
| <i>Termiticides Consumer Information</i> | 1988 | EPA/OPTS/OPP | Jackie Bishop (703) 557-4474 (FTS) 557-4474 |
| <i>To Protect Your Family Here Are Some Simple Things You Shouldn't Be Without - A Guide to Radon</i> | 1989 | EPA and Ad Council | Earl Ashton (202) 475-8386 (FTS) 475-8386 |
| <i>Has Your Home Been Invaded by Radon?</i> | 1989 | EPA and Ad Council | |
| <i>Radon in Schools - Every School Should Take This Simple Test</i> | 1989 | EPA, NEA, and PTA | |

PUBLICATIONS AVAILABLE FROM FEDERAL AGENCIES

| TITLE | DATE | LEAD AGENCY/OFFICE | CONTACT |
|---------------------------------------------------------------------------------------|------|---------------------|------------------------------------------------------------------------------------|
| U.S. CONSUMER PRODUCT SAFETY COMMISSION | | | |
| <i>Asbestos in Your Home</i> | 1990 | CPSC, EPA and ALA | CPSC Hotline (800) 638-CPSC |
| <i>Safety Alert on Humidifiers</i> | 1988 | CPSC | |
| <i>Biological Pollutants in Your Home</i> | 1990 | CPSC and ALA | |
| <i>Safety Alert on Lead in Paint</i> | 1990 | CPSC | |
| <i>Methylene Chloride Safety Alert</i> | 1987 | CPSC | |
| <i>Stripping Paint from Wood</i> | 1989 | CPSC and HSIA | |
| U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES | | | |
| <i>Guidance for Indoor Air Quality Investigations</i> | 1987 | DHHS/CDC/NIOSH | David Sundin (513) 841-4382 (FTS) 684-4382 |
| <i>Indoor Air Quality – Selected References</i> | 1989 | DHHS/CDC/NIOSH | Technical Information Branch, NIOSH Information Number: (800) 356-4674 |
| <i>The Surgeon General's Report on the Health Consequences of Involuntary Smoking</i> | 1986 | DHHS/CDC/CCDPHP/OSH | Technical Information Center, Office on Smoking and Health (301) 443-1690 |
| <i>Reducing the Health Consequences of Smoking: 25 Years of Progress</i> | 1989 | DHHS/CDC/CCDPHP/OSH | |
| TENNESSEE VALLEY AUTHORITY | | | |
| <i>How Clean is Our Air? A Decade of Change</i> | 1990 | TVA | William Parkhurst (205) 386-2793 (No FTS) |
| <i>Indoor Air Quality: How It Affects You</i> | 1988 | TVA | |