

# **NATIONAL AIR TOXICS INFORMATION CLEARINGHOUSE**



Office of Air Quality Planning and Standards  
Research Triangle Park, North Carolina 27711

STAPPA / ALAPCO

State and Territorial Air Pollution Program Administrators  
Association of Local Air Pollution Control Officials

## **Bibliography of Selected Reports and Federal Register Notices Related to Air Toxics**

### **Volume 5: Citations - 1991**

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NATIONAL AIR TOXICS INFORMATION CLEARINGHOUSE:  
BIBLIOGRAPHY OF SELECTED REPORTS AND  
FEDERAL REGISTER NOTICES RELATED TO AIR TOXICS  
VOLUME 5: CITATIONS - 1991

FINAL REPORT

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## PREFACE

In response to State and local agency requests for air toxics information and to support these agencies in their air pollution control efforts, the U. S. Environmental Protection Agency has developed an information dissemination center, known as the National Air Toxics Information Clearinghouse (NATICH). The design and implementation of the Clearinghouse has been conducted in close coordination with the State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO).

The purpose of this bibliography is to provide State and local agencies with citations of reports and Federal Register notices useful in developing and operating air toxics control programs. The reports selected for this bibliography were published by the following agencies: U. S. Environmental Protection Agency (EPA), National Academy of Sciences (NAS), National Cancer Institute (NCI), National Institute of Environmental Health Sciences (NIEHS) including the National Toxicology Program (NTP), National Institute for Occupational Safety and Health (NIOSH), Agency for Toxic Substances and Disease Registry (ATSDR), Consumer Products Safety Commission (CPSC), and World Health Organization (WHO) including the International Agency for Research on Cancer (IARC). Relevant reports published by various State and local agencies are also included in this edition. This edition of the bibliography updates the cumulative bibliography previously published by the National Air Toxics Information Clearinghouse, Bibliography of Selected Reports and Federal Register Notices Related to Air Toxics, five volumes: Volume 1: Citations (July 1987); Volume 2: Citations - 1988 (July 1988); Volume 3: Citations - 1989 (July 1989); Volume 4: Citations - 1990 (July 1990); and Index - 1990 (July 1990). The citations selected this year were compiled from sources available through January 31, 1991.

The Clearinghouse plans to continue to update this bibliography on a regular basis. Other publications of the Clearinghouse include:

- National Air Toxics Information Clearinghouse: Rationale for Air Toxics Control in Seven State and Local Agencies, EPA-450/5-86-005, PB86-181179/AS, August 1985;
- National Air Toxics Information Clearinghouse: How The Clearinghouse Can Help to Answer Your Air Toxics Questions, EPA-450/5-86-009, PB88-157813/XAB, July 1986;

- National Air Toxics Information Clearinghouse: Methods for Pollutant Selection and Prioritization, EPA-450/5-86-010, PB87-124079/XAB, July 1986;
- National Air Toxics Information Clearinghouse: Qualitative and Quantitative Cancer Risk Assessment, EPA-450/5-87-003, PB88-113188/XAB, June 1987;
- National Air Toxics Information Clearinghouse: Bibliography of Selected Reports and Federal Register Notices Related to Air Toxics Volume 1: Citations - 1987, EPA-450/5-87-005, PB88-136601/REB, July 1987, Volume 2: Citations - 1988, EPA-450/5-88-005, PB89-103436/REB, July 1988; Volume 3: Citations - 1989, EPA-450/3-89-25, PB90-270570/REB; Volume 4: Citations - 1990, EPA-450/3-90-014, PB91-168435/XAB, July 1990; Volume 5: Citations - 1991, EPA-450/3-91-016, NTIS number not yet available; and Index - 1991, EPA-450/3-91-017, NTIS number not yet available, July 1991;
- National Air Toxics Information Clearinghouse: NATICH Data Base Users Guide for Data Entry and Editing, EPA-450/5-88-001, PB88-202734/XAB, February 1988;
- National Air Toxics Information Clearinghouse: NATICH Data Base Users Guide for Data Viewing, EPA-450/5-88-002, PB88-197470/XAB, February 1988;
- National Air Toxics Information Clearinghouse: Case Studies in Risk Communication, EPA-450/5-88-003, PB89-104277/XAB, May 1988;
- National Air Toxics Information Clearinghouse: NATICH Data Base Report on State, Local, and EPA Air Toxics Activities, EPA-450/3-91-018, NTIS number not yet available, September 1991;
- National Air Toxics Information Clearinghouse Newsletter, a bimonthly periodical, 39 issues to date, December 1983 - May 1991; and
- National Air Toxics Information Clearinghouse: Ongoing Research and Regulatory Development Projects, EPA-450/3-91-015, NTIS number not yet available, July 1991.

## ABSTRACT

The National Air Toxics Information Clearinghouse has been established by the U. S. Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards for the purpose of facilitating information transfer among Federal, State, and local air quality management agencies. This document has been published as part of that effort. The purpose is to provide State and local agencies and other Clearinghouse users with bibliographic citations of reports and Federal Register notices useful in developing and operating air toxics control programs. The reports selected for this bibliography were published by the following agencies: U. S. Environmental Protection Agency, National Academy of Sciences, National Cancer Institute, National Institute of Environmental Health Sciences including the National Toxicology Program, National Institute for Occupational Safety and Health, Agency for Toxic Substances and Disease Registry, Consumer Products Safety Commission, and World Health Organization including the International Agency for Research on Cancer. Also included are reports published by various State and local agencies that they submit directly to the data base.

The bibliography is published in five volumes plus an index. Volume 1 (EPA-450/5-87-005, PB88-136601/REB) contains cumulative citations from before 1974 through March 1987, and Volume 2 (EPA-450/5-88-005, PB89-103436/REB), the citations from April 1987 through March 1988. Volume 3 (EPA-450/3-89-25, PB90-270570/REB) has citations from April 1988 through January 1989, and Volume 4 (EPA-450/3-90-014, PB91-168435/XAB) has citations from January 1989 to January 1990. Volume 5 has the more recent citations from January 1990 to January 1991. This volume consists of two sections. Section 1 includes introductory material describing the bibliography scope and organization and contains information necessary for the proper use of the document. This part updates the corresponding part in Volumes 1, 2, 3, and 4. Volume 5, Section 2 contains the report and Federal Register notice entries with bibliographic information and, in most cases, an abstract. The current index to the bibliography (Index - 1991, EPA-450/3-91-017) covers all the reports from 1974 to the present. Each listing indicates which of the five volumes contains the citation. The index is organized by document type; by pollutant class, name, or Chemical Abstracts Service (CAS) number; by Standard Industrial Classification (SIC) Code; and by sponsoring agency.

This document was submitted in partial fulfillment of EPA Contract No. 68-DB-0065, Work Assignment No. 3-7, by Radian Corporation under the sponsorship of the U. S. Environmental Protection Agency. This edition of the bibliography updates previous bibliographies published by the National Air

Toxics Information Clearinghouse. The Clearinghouse will continue to publish regular updates in separate volumes, consecutively numbered. Each year, a new cumulative index will be published that expands and replaces the previous year's edition. The 1991 index allows users to identify publications of interest in Volumes 1, 2, 3, 4, or 5. With distribution of the 1991 Index, EPA encourages users to recycle the 1990 Index.

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## 1.0 INTRODUCTION

This bibliography has been developed by the National Air Toxics Information Clearinghouse, operated by the Pollutant Assessment Branch of the U. S. Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS). A total of 157 bibliographic citations to reports and Federal Register notices related to toxic air pollutants are included. To facilitate the use of this bibliography, citations are indexed by document type, chemical name or class and Chemical Abstract Service (CAS) number, Standard Industrial Classification (SIC) Code, and sponsoring agency.

Like other Clearinghouse publications, the bibliography is designed to help Clearinghouse users identify sources of information for specific air toxics questions or problems. This edition of the bibliography announces 150 new reports and Federal Register notices.

The information contained in this bibliography is also available through the National Air Toxics Information Clearinghouse on-line data base - NATICH. For more information about accessing NATICH, contact the Clearinghouse staff at (919) 541-0850, (FTS) 629-0850.

### 1.1 DOCUMENT SCOPE

This bibliography contains a selected list of reports and Federal Register notices that have been identified as being useful to State and local agencies developing and operating air toxics control programs. The reports were published by the following agencies: EPA, National Academy of Sciences (NAS), National Cancer Institute (NCI), National Institute of Environmental Health Sciences (NIEHS) including National Toxicology Program (NTP), National Institute for Occupational Safety and Health (NIOSH), Agency for Toxic Substance and Disease Registry (ATSDR), Consumer Products Safety Commission (CPSC), and the World Health Organization (WHO) including the International Agency for Research on Cancer (IARC). Reports published by State and local agencies are also included.

The citations include documents of the following types:

- Accident prevention/emergency response
- Ambient monitoring
- Case studies (used only by State and local agencies)
- Chemical Hazard Information Profile (CHIP, used only by EPA)
- Clean Air Act Title III guidance/documents
- Control program support (used only by State and local agencies)

- Control technology
- Dispersion modeling
- Emission factor documents
- Epidemiological studies
- Exposure assessments
- Federal Register notices
- Health assessments
- Indoor air
- National Emission Standards for Hazardous Air Pollutants (NESHAP, used only by EPA)
- New Source Performance Standards (NSPS, used only by EPA)
- Pollution prevention
- Pre-regulatory assessments
- Regulatory development guidance
- Risk assessments
- Rules and regulations (used only by State and local agencies)
- Source assessments
- Source sampling
- Toxicity testing

This year's literature search included citations for Clean Air Act Title III guidance/documents, but no were identified. Citations were selected within each document type according to their relevance to air toxics work. The background information documents for new source performance standards (NSPS) were included in this bibliography because, although their focus is on control of criteria air pollutants, they also contain valuable information on the sources and control of noncriteria, potentially toxic air pollutants. The Federal Register notices include the Agency's announcements regarding Sections 111 and 112 of the Clean Air Act dealing with the NSPS and the national emission standards for hazardous air pollutants (NESHAP) programs, respectively. The notices also include proposed guidelines concerning health, exposure, and risk assessments issued by the Office of Health and Environmental Assessment (OHEA).

Citations for each of these topic areas were compiled by searching published lists of EPA reports, such as the EPA Publications Bibliography and the ORD Publications Announcement. These citations were supplemented by contacting the EPA office currently conducting that particular type of work. The EPA offices contacted are listed in Table 1.

TABLE 1. LIST OF EPA OFFICES CONTACTED\*

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Office of Air and Radiation (OAR)

Office of Air Quality Planning and Standards (OAQPS)

Office of Atmospheric and Indoor Air Programs (OAIAP)

Office of Mobile Sources (OMS)

Office of Radiation Programs (ORP)

Office of Pesticides and Toxic Substances (OPTS)

Office of Toxic Substances (OTS)

Office of Pesticide Programs (OPP)

Office of Policy, Planning and Evaluation (OPPE)

Office of Pollution Prevention (OPP)

Office of Research and Development (ORD)

Office of Health and Environmental Assessment (OHEA)

Office of Health Research (OHR)

Office of Environmental Engineering and Technology Demonstration (OEETD)

Office of Modeling, Monitoring Systems and Quality Assurance (OMMSQA)

Office of Solid Waste and Emergency Response (OSWER)

Office of Solid Waste (OSW)

Office of Emergency and Remedial Response (OERR)

Office of Water (OW)

Office of Science and Technology (OST)

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\* Not all divisions or laboratories are contacted.

Abstracts for the EPA reports were obtained from the EPA Publications Bibliography, the National Technical Information Service (NTIS) data base, or the technical data sheet included in the report. Abstracts for the Federal Register notices were prepared from the Summary and Supplementary Information sections of each notice.

Citations to reports from the eight other sponsoring agencies (NAS, NIEHS, NTP, NIOSH, ATSDR, CPSC, and WHO) included in this bibliography focus on health, risk, exposure assessments, toxicity testing, and epidemiology studies. Most documents discuss one or more potentially toxic chemicals, and a few emphasize exposure to toxic substances in a particular industry. Although ambient air exposure was the primary area of interest, reports on occupational exposure and exposure via drinking water were also included.

The research of the National Institute of Environmental Health Sciences (NIEHS) is included in a single citation by reference to the National Institute of Environmental Health Sciences Bibliography 1966-1989 (most current edition as of May 1991). The research results are generally published in technical journal articles, conference papers, and books. These types of publications were outside the scope of the bibliography.

Citations to reports from each of the eight agencies on the topics of risk and exposure assessments and health effects were compiled from agency catalogs. Abstracts were obtained from each of these sources when available.

In addition to reports by EPA and the eight other agencies, this bibliography includes citations to relevant reports published by State and local agencies. These citations are submitted by the agencies directly to the Clearinghouse and are available from these agencies.

This document also contains an index to the National Air Toxics Information Clearinghouse Newsletter. The Newsletter is currently published bimonthly by the Clearinghouse to inform readers of current issues relating to toxic air pollutants. Articles discuss activities at the Federal, State, and local levels.

## 1.2 ORGANIZATION OF DOCUMENT

This document has been published in five volumes and an index. Volume 1 (EPA-450/5-87-005, PB88-136601/REB) contains cumulative citations from before 1974 through March 1987, Volume 2 (EPA-450/5-88-005, PB89-103436/REB) the citations from April 1987 through March 1988. Volume 3 (EPA-450/3-89-25, PB90-270570/REB) has citations from April 1988 through January 1989 and Volume 4 (EPA-450/3-90-014, PB91-168435/XAB) has citations from January 1989 to January 1990. Volume 5 has the more recent citations from January 1990 to January 1991. This volume consists of two sections. Section 1 is the

introductory material discussing scope and organization. It also contains explanatory information necessary for the proper use of the bibliography, such as keys to agency and office abbreviations and two sample bibliographic entries, as well as ordering information for reports by EPA and the other agencies. Section 2 of Volume 5 contains the report and Federal Register notice entries with bibliographic information and, in most cases, an abstract. The report entries are arranged by document order number. Figure 1 explains each line of two sample entries. Each entry has been assigned certain key words or descriptors pertaining to document type, pollutant, source whenever an SIC Code applies, and sponsoring agency. These descriptors are used to generate the index and to give users several ways to access reports of interest. The Newsletter index also appears in Volume 5 as an appendix.

The current index (Index - 1991, EPA-450/3-91-017) enables users to identify reports of interest in Volumes 1, 2, 3, 4, or 5 (the volume number in parentheses will appear immediately preceding the publication number). Index categories include document type, pollutant class or name and CAS number, SIC Code and the corresponding title, and sponsoring agency. Groups of chemicals or pollutants such as "organic compounds" that could not be identified more precisely by individual chemical names were assigned unique Clearinghouse identifiers in the place of CAS numbers. A list of these identifiers is found in Table 2. A key to the international and national sponsoring agency acronyms appears in Table 3. Table 4 lists the document types and their abbreviations. A table of contents to the index is found at the beginning of the index. This table of contents consists of an alphabetic and numeric list of all descriptors, along with their corresponding page numbers in the index. These descriptors, or index terms, represent subject headings that describe the content of a document.

A second series of key words allows users to identify specific State agency reports. Each agency has a unique four-place alphanumeric code by which it is indexed, for example, the South Coast Air Quality Management District in California is CA03. Because Federal agency key words are already in use, a generic keyword EPA has been assigned. Although this term appears in the keyword list following the relevant citation, it is not used for indexing.

This bibliography is updated regularly by the National Air Toxics Information Clearinghouse. In the next update, the Clearinghouse will publish abstracts only for the newly identified reports and Federal Register notices, but will publish a cumulative index to all citations (Volumes 1, 2, 3, 4, and 5) for use after July 1991.

## FIGURE 1. SAMPLE ENTRIES

Report entries are arranged alphanumerically by document order number.

A sample entry follows:

PB84-156157

Demonstration of Remedial Techniques Against Radon in Houses on Florida  
Phosphate Lands

EPA, Montgomery, AL, ORP/EERF

July 1983, 195p, EPA-520/5-83-009, PC A09/MF A01

**Abstract:** This report is to document the results of an activity which forms part of a program intended to demonstrate means of controlling indoor radon levels in structures built on Florida phosphate lands. The natural radon content of the soil is elevated in some parts of the Florida phosphate lands, resulting in elevated radon concentrations in the soil gas. If building construction is such as to provide pathways, or routes of entry, between the interior of the building and the soil below, then this radon-bearing soil gas may enter the building and result in elevated indoor levels. This report therefore documents a review of current building practices, with the intention of identifying routes of entry. Based upon this knowledge, certain modifications to building practices may be seen as a means of reducing indoor radon levels.

CL-PHOSPHA	PHOSPHATES
CT	CONTROL TECHNOLOGY DOCUMENT
EPA	ENVIRONMENTAL PROTECTION AGENCY
IA	INDOOR AIR
10043-92-2	RADON
14	NONMETALLIC MINERALS, EXCEPT FUELS
147	CHEMICAL AND FERTILIZER MINERALS
1475	PHOSPHATE ROCK
52	BUILDING MATERIALS AND GARDEN SUPPLIES
7440-61-1	URANIUM



FIGURE 1. SAMPLE ENTRIES (Continued)

A sample Federal Register notice entry follows:

45 FR 83952 12-19-80

Benzene Emissions from Benzene Storage Vessels; National Emission Standard for Hazardous Air Pollutants; Hearing  
EPA, Research Triangle Park, NC, OAQPS

Abstract: Proposed rule and notice of public hearing. The proposed standard would limit benzene emissions from each new and existing storage vessel with a capacity greater than 4 cubic meters used to store pure benzene. The notice describes proposed requirements for fixed/floating roofs, primary and secondary seals, and inspection procedures.

EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FEDERAL REGISTER NOTICES
NESHAP	NAT'L EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS
34	FABRICATED METAL PRODUCTS
344	FABRICATED STRUCTURAL METAL PRODUCTS
3443	FABRICATED PLATE WORK (BOILER SHOPS)
71-43-2	BENZENE

TABLE 2. CLEARINGHOUSE CHEMICAL IDENTIFIERS

Clearinghouse #	Pollutant
CL-ABRAS	Abrasives
CL-ACID	Acidic compounds
CL-ADIP	Adipates
CL-ALDEHYD	Aldehydes
CL-ALKYLPB	Alkyl lead compounds
CL-ALLERG	Allergens
CL-ALMERC	Alkyl mercury compounds
CL-ALUM	Aluminum compounds
CL-AMINE	Amines
CL-AROMHC	Aromatic hydrocarbons
CL-BACT	Bacteria
CL-BROM	Bromine compounds
CL-BTX	Benzene, toluene, xylene
CL-CADMIUM	Cadmium compounds
CL-CARBON	Total carbon
CL-CARCIN	Carcinogens
CL-CFC	Chlorofluorocarbons
CL-CHC	Chlorinated hydrocarbons
CL-CHLOR	Chlorine compounds
CL-CHROME	Chromium compounds
CL-COE	Coke oven emissions
CL-CONSUMR	Consumer products
CL-COPPER	Copper compounds
CL-COTDUST	Cotton dust
CL-CREOSOL	Creosols
CL-CUTFLU	Cutting fluids
CL-DGAEA	Diethylene glycol alkyl ethers and acetates
CL-DIESEL	Diesel fuel emissions
CL-DIISOCY	Diisocyanates
CL-DIOXIN	Dioxins
CL-DYE	Dyes
CL-ETHERS	Ethers
CL-ETS	Environmental tobacco smoke
CL-EXPLO	Explosives
CL-FUELOIL	Waste derived fuel oil emissions
CL-FUNG	Fungicides
CL-FURAN	Furans
CL-GLASS	Fibrous glass dust
CL-HALOGHC	Halogenated hydrocarbons
CL-HALOME	Halomethanes
CL-HAPS	Title III hazardous air pollutants
CL-HAZWAST	Hazardous wastes
CL-HCARB	Hydrocarbons
CL-HERB	Herbicides
CL-HEXANE	Hexane isomers
CL-IAP	Indoor air pollutants
CL-INMERC	Aryl and inorganic mercury compounds
CL-INORGAN	Inorganic compounds
CL-INOTIN	Inorganic tin and oxide compounds
CL-INSMOLY	Insoluble molybdenum compounds
CL-INSRHOD	Insoluble rhodium compounds
CL-INSTUNG	Insoluble tungsten compounds
CL-IRON	Iron compounds
CL-MANG	Manganese compounds

TABLE 2. CLEARINGHOUSE CHEMICAL IDENTIFIERS (Continued)

Clearinghouse #	Pollutant
CL-MAPP	Methyl acetylene-propadiene mixture
CL-METAL	Metallic compounds
CL-METOBZ	Methoxybenzene compounds
CL-MINDUST	Mineral dusts
CL-MINFIB	Mineral fibers
CL-MOM	Mineral oil mist
CL-MS	Mineral spirits
CL-NICKEL	Nickel compounds
CL-NITRATE	Nitrates
CL-NITRITE	Nitrites
CL-NITROSO	Nitroso compounds
CL-NMHC	Non-methane hydrocarbons
CL-ODOR	Odors
CL-OH	Hydroxides
CL-ORGANIC	Organic compounds
CL-PAH	Polycyclic aromatic hydrocarbons
CL-PATHOGN	Pathogens
CL-PCO	Photochemical oxidants
CL-PEST	Pesticides
CL-PHARM	Pharmaceuticals
CL-PHENOL	Phenols
CL-PHOSPHA	Phosphates
CL-PHTH	Phthalates
CL-PLAS	Plasticizers
CL-PLAT	Platinum compounds
CL-PM	Particulate matter
CL-POM	Polycyclic organic matter
CL-PYRO	Pyro powders
CL-RAD	Radiation
CL-RCSPP	Rosin core solder pyrolysis products
CL-RESIN	Resins
CL-ROSIN	Rosin vapors
CL-RUBSOL	Rubber solvents
CL-SALTS	Salts
CL-SEWSLUD	Sewage sludge
CL-SILVER	Silver compounds
CL-SOLMOLY	Soluble molybdenum compounds
CL-SOLRHOD	Soluble rhodium compounds
CL-SOLTUNG	Soluble tungsten compounds
CL-SOLVENT	Solvents
CL-SPORES	Fungal spores
CL-SULFATE	Sulfates
CL-SULFIDE	Sulfides
CL-SULFITE	Sulfites
CL-SVOC	Semivolatile organic compounds
CL-TIN	Organic tin compounds
CL-TRS	Total reduced sulfur
CL-VARIOUS	Various pollutants
CL-VEG	Vegetable oil mist
CL-VOC	Volatile organic compounds
CL-WELD	Welding fumes
CL-WOOD	Wood smoke

TABLE 3. LIST OF ACRONYMS

KEY TO AGENCY ACRONYMS\*

ATSDR	Agency for Toxic Substances and Disease Registry
EPA	U. S. Environmental Protection Agency
CPSC	Consumer Products Safety Commission
IARC	International Agency for Research on Cancer
NAS	National Academy of Sciences
NCI	National Cancer Institute
NIEHS	National Institute of Environmental Health Sciences
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
WHO	World Health Organization

KEY TO DIVISION AND LABORATORY ACRONYMS

AEERL	Air and Energy Engineering Research Laboratory
AQMD	Air Quality Management Division
AREAL	Atmospheric Research and Exposure Assessment Laboratory
ASMD	Atmospheric Sciences Modeling Division
ASRL	Atmospheric Sciences Research Laboratory
CAD	Characterization and Assessment Division
CSD	Criteria and Standards Division
EAG	Exposure Assessment Group
EARD	Exposure Assessment Research Division
ECAD	Existing Chemical Assessment Division
ECOA	Environmental Criteria and Assessment Office
EERF	Eastern Environmental Radiation Facility
EML	Emission Measurement Laboratory
EMSL	Environmental Monitoring Systems Laboratory
ERD	Emergency Response Division
ESD	Emission Standards Division
HECD	Health and Ecological Criteria Division
HED	Hazard Evaluation Division
HERL	Health Effects Research Laboratory
HHAG	Human Health Assessment Group
IAD	Indoor Air Division
RREL	Risk Reduction Engineering Laboratory
SSCD	Stationary Source Compliance Division
TSD	Technical Support Division
WMD	Waste Management Division

\* Reports by State and local agencies are indexed under the term "State or Local Agency." Report numbers begin with the two-letter State abbreviation.

TABLE 4. KEY TO DOCUMENT TYPES

---

AM	Ambient Monitoring
CHIP	Chemical Hazard Information Profile (EPA Only)
CS	Case Study (State and Local Agencies Only)
CT	Control Technology
DM	Dispersion Modeling
EA	Exposure Assessment
EF	Emission Factor
ER	Accident Prevention/Emergency Response
ES	Epidemiological Study
FR	<u>Federal Register</u> Notices
HA	Health Assessment
IA	Indoor Air
NESHAP	National Emission Standards for Hazardous Air Pollutants (EPA Only)
NSPS	New Source Performance Standards (EPA Only)
OT	Other (State and Local Agencies Only)
PD	Air Toxics Program Support Document (State and Local Agencies Only)
PP	Pollution Prevention
PRA	Pre-regulatory Assessment
RA	Risk Assessment
RDG	Regulatory Development Guidance
RR	Rules and Regulations (State and Local Agencies Only)
SA	Source Assessment
SS	Source Sampling
TITLE3	Clean Air Act Title III Guidance/Documents
TT	Toxicity Testing

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All bibliographic citations will continue to be accessible through the NATICH on-line data base. These can be sorted by a combination of factors: by product, and/or source category, and/or document type, and/or sponsoring agency.

### 1.3 ORDERING INFORMATION

#### CONSUMER PRODUCT SAFETY COMMISSION

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NIOSH Publication Dissemination, R-6  
4676 Columbia Parkway  
Cincinnati, Ohio 45226-1998  
(513) 533-8287

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U. S. Government Printing Office  
Washington, D.C. 20402  
(202) 783-3238

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National Air Toxics Information Clearinghouse publications are also available free of charge to Federal, State, and local agencies, as well as nonprofit organizations, by contacting the Clearinghouse staff at (919) 541-0850, (FTS) 629-0850. The private sector may purchase Clearinghouse reports from NTIS, or from Radian Corporation at (512) 454-4797, ext. 5224. The Clearinghouse Newsletter is available free of charge to all interested persons by contacting the Clearinghouse staff at (919) 541-0850 or (FTS) 629-0850 to be placed on the Clearinghouse mailing list.

#### WORLD HEALTH ORGANIZATION AND INTERNATIONAL AGENCY FOR RESEARCH ON CANCER

Publications from the WHO, including IARC reports, are available from:

WHO Publications Center, USA  
49 Sheridan Avenue  
Albany, New York 12210  
(518) 436-9686

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Customer Service Department  
Oxford University Press  
16-00 Pollitt Drive  
Fair Lawn, New Jersey 07410  
1-800-451-7556

## 2.0 REPORT AND FEDERAL REGISTER NOTICE ENTRIES

GPO 055-000-00367-0

Environmental Hazards in Your School: A Resource Handbook

EPA

1990, 75p, \$2.25

Abstract: This publication provides information on a number of the environmental hazards children may be exposed to in school buildings. These include asbestos, indoor air pollutants, radon, lead in drinking water, and other contaminants in school-operated water systems. Organizations: National Education Association, National Parent Teacher Association, Council for American Private Education, Occupational Health Foundation, National Association of Independent Schools, and United States Catholic Conference.

EPA	ENVIRONMENTAL PROTECTION AGENCY
IA	INDOOR AIR
10043-92-2	RADON
1332-21-4	ASBESTOS
7439-92-1	LEAD POWDER
82	EDUCATIONAL SERVICES
821	ELEMENTARY AND SECONDARY SCHOOLS
8211	ELEMENTARY AND SECONDARY SCHOOLS

HEA 90

Health Effects Assessment for . . .

EPA, Cincinnati, OH, ECAO

Various dates, Length varies, Available from NTIS

Abstract: The report summarizes and evaluates information relevant to a preliminary interim assessment of adverse health effects associated with specific chemicals or compounds. The Office of Emergency and Remedial Response (Superfund) uses these documents in preparing cost-benefit analyses under Executive Order 12991 for decision-making under CERCLA. All estimates of acceptable intakes and carcinogenic potency presented in the document should be considered as preliminary and reflect limited resources allocated to the project. The intent in the assessments is to suggest acceptable exposure levels whenever sufficient data are available. The interim values presented reflect the relative degree of hazard associated with exposure or risk to the chemical(s) addressed. Whenever possible, two categories of values have been estimated for systemic toxicants (toxicants for which cancer is not the endpoint of concern). The first, RfDS or subchronic reference dose, is an estimate of an exposure level that would not be expected to cause adverse effects when exposure occurs during a limited time interval. The RfD is an estimate of an exposure level that would not be expected to cause adverse effects when exposure occurs for a significant portion of the lifespan.

EPA	ENVIRONMENTAL PROTECTION AGENCY
HA	HEALTH ASSESSMENT
100-42-5	STYRENE
108-95-2	PHENOL
127-18-4	TETRACHLOROETHYLENE
1330-20-7	XYLENE
50-29-3	DDT
56-23-5	CARBON TETRACHLORIDE
57-74-9	CHLORDANE
67-64-1	ACETONE
67-66-3	CHLOROFORM
71-43-2	BENZENE
7440-43-9	CADMIUM
75-09-2	METHYLENE CHLORIDE
78-93-3	METHYL ETHYL KETONE
79-01-6	TRICHLOROETHYLENE
91-20-3	NAPHTHALENE
93-76-5	TRICHLOROPHENOXYACETIC ACID, 2,4,5-

**MD017886-02**

**AMBIENT AIR QUALITY IMPACT SCREENING MODEL PROCEDURES FOR TOXIC AIR POLLUTANTS.**

**MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
MARYLAND AIR MANAGEMENT ADMINISTRATION  
11/01/86, 46 pages**

THIS TECHNICAL DOCUMENT IS INTENDED TO ASSIST SOURCES IN CALCULATING AMBIENT LEVELS OF TOXIC AIR POLLUTANTS (TAPS) TO DETERMINE COMPLIANCE WITH MARYLAND'S DRAFT AIR TOXICS REGULATIONS. THE DOCUMENT OUTLINES, STEP-BY-STEP, SIMPLE SCREENING MODEL PROCEDURES FOR ESTIMATING AMBIENT CONCENTRATIONS OF TAPS. THE PROCEDURES ALSO ALLOW A SOURCE TO CALCULATE THE EMISSION RATE WHICH WOULD CREATE A CONCENTRATION EQUAL TO THE SCREENING LEVEL OF THE SUBSTANCE DISCHARGED. THE PROCEDURES HAVE BEEN DEVELOPED TO MINIMIZE THE VARIABLES INVOLVED AND REQUIRE ONLY INFORMATION DESCRIBING EMISSIONS AND SOURCE CHARACTERISTICS. BOTH POINT SOURCES (I.E. STACK AND VENTS) AND AREA SOURCES (I.E. FUGITIVE EMISSIONS, STOCKPILES) CAN BE EASILY EVALUATED USING THESE PROCEDURES. IT MUST BE POINTED OUT THAT THESE PROCEDURES WILL ALMOST ALWAYS OVERESTIMATE ACTUAL AMBIENT CONCENTRATIONS. (PRICE: \$5.)

DM DISPERION MODELING  
MD01 MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
PD AT SUPPORT DOCUMENT  
STATE/LOC STATE OR LOCAL AGENCY

**MD018601**

**MARYLAND'S AIR TOXIC CONTROL PROGRAM: WORKING GROUP DELIBERATIONS.  
MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
SUSAN S.G. WIERMAN, GEORGE S. ABURN, DOROTHY M. GUY, JOEL H. COOPER.  
05/01/86, 170 pages**

THIS DOCUMENT CONTAINS THE MINUTES OF 10 MEETINGS OF A WORKING GROUP FORMED TO ASSIST MARYLAND IN DEVELOPING DRAFT AIR TOXIC REGULATIONS. THE GROUP, FORMED TO ENSURE THAT ALL INTERESTS WERE CONSIDERED, REPRESENTED THE BUSINESS COMMUNITY, ENVIRONMENTAL GROUPS, THE STATE LEGISLATURE, EPA, AND ACADEMIA. THE WORKING GROUP PROVIDED A FORUM FOR IDENTIFYING AND RESOLVING ISSUES OF CONCERN ASSOCIATED WITH THE DRAFT REGULATIONS. THE DOCUMENT ALSO EXPLAINS MARYLAND'S PRELIMINARY PROPOSED PROGRAM DESIGN. (PRICE: \$16.)

MD01 MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
PD AT SUPPORT DOCUMENT  
STATE/LOC STATE OR LOCAL AGENCY

**MD018602**

**DEVELOPING AN AIR TOXICS CONTROL PROGRAM FOR THE STATE OF MARYLAND.  
MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
ABURN, GEORGE S. JR., FERRERI, GEORGE P., AND WIERMAN, SUSAN S.G.  
06/01/86, 9 pages**

THIS PAPER PRESENTED AT THE 79TH ANNUAL MEETING OF THE AIR POLLUTION CONTROL ASSOCIATION IN MINNEAPOLIS, MINNESOTA, DESCRIBES THE PROCESS MARYLAND HAS USED IN DEVELOPING ITS AIR TOXICS CONTROL PROGRAM, BRIEFLY SUMMARIZES THE PRELIMINARY PROGRAM DESIGN, AND IDENTIFIES ISSUES THAT HAVE ARISEN IN THIS PROCESS. THE AUTHORS' INTENT IS TO PROVIDE INFORMATION THAT MAY BE USEFUL TO OTHER STATES INVOLVED IN SIMILAR PROJECTS. (PRICE \$2.)

MD01 MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
PD AT SUPPORT DOCUMENT  
STATE/LOC STATE OR LOCAL AGENCY

**MD018603**

**RISK ASSESSMENT AND MARYLAND'S PROPOSED AIR TOXICS PROGRAM  
MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
MARYLAND AIR MANAGEMENT ADMINISTRATION  
09/01/87, 256 pages**

THIS DOCUMENT CONTAINS THE PROCEEDINGS OF A SEMINAR ON RISK ASSESSMENT HELD IN THE BALTIMORE AREA ON SEPTEMBER 18, 1986. SPEAKERS AT THE SEMINAR INCLUDED REGION III ADMINISTRATOR JAMES SEIF; DR. PETER PREUSS, DIRECTOR OF EPA'S OFFICE OF HEALTH AND ENVIRONMENTAL ASSESSMENT; AND DR. MORTON CORN, DIRECTOR OF THE DIVISION OF ENVIRONMENTAL HEALTH ENGINEERING AT THE JOHNS HOPKINS UNIVERSITY.

THE PROCEEDINGS CONTAIN EPA'S Nontechnical REVIEW OF THE PRINCIPLES OF RISK ASSESSMENT, DR. CORN'S CRITIQUE OF THE USE OF THRESHOLD LIMIT VALUES TO ESTABLISH AMBIENT GUIDELINES FOR CARCINOGENS, EPA'S SUMMARY REPORT ON A DIOXIN ANALYSIS OF PHILADELPHIA'S NORTHWEST INCINERATOR, AND OTHER PAPERS ON RISK ASSESSMENT, RISK MANAGEMENT, RISK COMMUNICATION, EPA'S AIR TOXICS POLICY, AND MARYLAND'S DRAFT AIR TOXICS REGULATIONS. (PRICE: \$23.)

MD01 MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
PD AT SUPPORT DOCUMENT  
STATE/LOC STATE OR LOCAL AGENCY

MD018604

ANALYSIS OF THE ECONOMIC IMPACT OF MARYLAND'S PROPOSED AIR TOXIC REGULATIONS

MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.

MARYLAND AIR MANAGEMENT ADMINISTRATION

12/01/86, 87 pages

THIS DOCUMENT DISCUSSES THE COSTS OF COMPLYING WITH THE MARYLAND'S DRAFT AIR TOXICS REGULATIONS. THE APPENDIX ANALYZES COSTS TO CONTROL FOUR HYPOTHETICAL EMISSIONS SOURCES.

COST TO BUSINESS WILL PRIMARILY RESULT FROM ESTIMATING EMISSIONS, MODELING THE IMPACT OF THESE EMISSIONS ON AMBIENT AIR QUALITY, AND CONTROLLING EMISSIONS. THE TOTAL COSTS TO ALL REGULATED BUSINESSES IS ESTIMATED TO RANGE FROM \$350,000-\$830,000 PER YEAR FOR THE FIRST FOUR YEARS AFTER THE REGULATIONS ARE ADOPTED.

A FEW SOURCES MAY INCUR SUBSTANTIAL COSTS FOR EMISSIONS CONTROLS BEYOND THOSE REQUIRED BY OTHER REGULATIONS. CONTROL COSTS WILL VARY FROM ZERO TO SEVERAL HUNDRED THOUSAND DOLLARS OR MORE. COSTS FOR SOURCES THAT MUST CONTROL EMISSIONS WILL BE RELATED TO THE PUBLIC HEALTH RISKS THEIR EMISSIONS CAUSE.

COSTS TO THE STATE ARE EXPECTED TO BE ABOUT \$250,000 FOR EQUIPMENT AND ABOUT \$250,000 PER YEAR FOR PERSONNEL AND OTHER OPERATING COSTS. (PRICE: \$8.)

MD01 MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
PD AT SUPPORT DOCUMENT  
STATE/LOC STATE OR LOCAL AGENCY

MD018701

TOXIC AIR POLLUTANTS COVERED BY MARYLAND'S PROPOSED AIR TOXICS REGULATIONS

MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.

MARYLAND AIR MANAGEMENT ADMINISTRATION

02/01/87, 79 pages

THIS DOCUMENT EXPLAINS THE SUBSTANCES COVERED BY MARYLAND'S PROPOSED AIR TOXICS PROGRAM. MARYLAND CLASSIFIES CARCINOGENS AS CLASS I TOXIC AIR POLLUTANTS (TAPS) AND OTHER TOXICS AS CLASS II TAPS. CLASS I TAPS ARE CARCINOGENS IDENTIFIED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) AND THE NATIONAL TOXICOLOGY PROGRAM (NTP). TO DEFINE CLASS II TAPS, MARYLAND USED OSHA'S HEALTH HAZARD CRITERIA. THIS DEFINITION OF CLASS II TAPS IS OPEN-ENDED, AND THERE IS NO LIST OF ALL CLASS II TAPS. MARYLAND HAS ESTABLISHED PRIORITY LISTS OF TAPS TO DEFINE AND LIMIT THE PROGRAM FOR EXISTING SOURCES. THE APPENDICES INCLUDE AN ANNOTATED LIST OF CARCINOGENS, THE IARC TOXIC AIR POLLUTANTS COVERED BY MARYLAND'S PROPOSED AIR TOXICS REGULATIONS PROCESS FOR EVALUATING CARCINOGENIC RISK, AND THE PRIORITY LIST OF CLASS I AND CLASS II TAPS FOR EXISTING SOURCES. (PRICE: \$8.)

MD01 MD DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMIN.  
PD AT SUPPORT DOCUMENT  
STATE/LOC STATE OR LOCAL AGENCY

OH01 DIOXIN D002

Determination of Polychlorinated Dibenzo-p-dioxins and Dibenzofurans from Hazardous Waste Incinerators in Ohio.

OHIO EPA, DIV. OF AIR POLLUTION CONTROL

OAQDA and Ohio EPA

10/31/91

Two sources of hazardous waste incineration in Ohio are being evaluated for potential PCDD and PCDF emissions into the atmosphere. One stack test and 2 ambient air tests are being completed for this study. Dioxin measurements will be described by conge profiles. This is the second study by Ohio EPA determining dioxin concentrations in ambient air. This project should be completed by the end of 1991, and will be available from Ohio EPA - Division of Air Pollution Control.

OH01 OHIO EPA, DIV. OF AIR POLLUTION CONTROL  
STATE/LOC STATE OR LOCAL AGENCY

OH01 LAKE ERIE E001

Input of toxic substances from the atmosphere to Lake Erie.

OHIO EPA, DIV. OF AIR POLLUTION CONTROL

OAQDA and Ohio EPA

49 pages

This study was an evaluation of the pathways by which chemicals enter Lake Erie. Existing data was combined with calculations of dry and wet deposition, input from tributaries, and vapor flux outputs to determine estimates of absolute amounts of toxic substances entering the lake. The relative contribution from atmospheric pathways also is stated. Thirteen chemicals had enough data available to be included in the final analysis. For most chemicals studied atmospheric input into Lake Erie is a minute fraction of the total input. A detailed report is available from Ohio EPA - Division of Air Pollution Control.

OH01 OHIO EPA, DIV. OF AIR POLLUTION CONTROL  
STATE/LOC STATE OR LOCAL AGENCY

OH01 RADON 1234

Ohio Radon Research directions

OHIO EPA, DIV. OF AIR POLLUTION CONTROL

OAQDA and Ohio EPA

var pages

Four radon research projects have been completed and are available for use by interested parties. 1. Correlation of measured radon in soil and uranium concentration of Ohio state, with diffusion coefficients for soil thickness. 2. Radon hazards associated with glacial deposits in Ohio. 3. Indoor radon concentrations in northeast Ohio counties, and 4. Radon hazards associated with outcrops of the Devonian Ohio state. Also, a computer data base is being established to compile all known indoor radon concentrations for the state. These studies were designed to help formulate Ohio's radon reduction program through the Ohio Department of Health.

OH01 OHIO EPA, DIV. OF AIR POLLUTION CONTROL  
STATE/LOC STATE OR LOCAL AGENCY

OH01 SEWSLUDGE S001

Toxic Air emissions from Sewage Sludge Incinerator in Ohio.  
OHIO EPA, DIV. OF AIR POLLUTION CONTROL  
OAQDA and Ohio EPA  
116 pages

Stack testing was performed on two sewage sludge incinerators in Ohio. Testing covered trace metals and organic compounds. This report summarizes the findings from the stack tests as well as characterizes the emissions from the other 12 incinerators of sewage sludge in Ohio. The results of this study are available from the Ohio EPA - Division of Air Pollution Control.

OH01 OHIO EPA, DIV. OF AIR POLLUTION CONTROL  
STATE/LOC STATE OR LOCAL AGENCY

PB90-110131

Indoor Air Sources: Using Small Environmental Test Chambers to Characterize Organic Emissions from Indoor Materials and Products  
EPA, Research Triangle Park, NC, AERL  
B.A. Tichenor  
Aug 89, 41p, EPA-600/8-89-074, PC A03/MF A01

Abstract: The report describes procedures for determining organic emission rates from indoor materials/products using small environmental test chambers. The techniques presented are useful for both routine product testing by manufacturers and testing laboratories and for more rigorous evaluation by indoor air quality researchers.

CL-ORGANIC ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
SS SOURCE SAMPLING

PB90-119785

Directory of Information Resources Related to Health, Exposure, and Risk Assessment of Air Toxics  
EPA, Research Triangle Park, NC, Air RISC  
Aug 89, 92p, EPA-450/3-88-015, PC A05/MF A01

Abstract: Many State and local agencies are developing or implementing programs to control emissions of toxic air pollutants. To successfully carry out these programs, in many cases, agency personnel must be familiar with a wide range of issues related to health, exposure, and risk assessment for toxic air pollutants. However, locating appropriate sources of information on these topics is not always an easy task. The directory has been prepared by the U.S. EPA's Air Risk Information Support Center (Air RISC) as a resource tool for State and local air pollution control agencies and EPA Regional Offices to identify useful sources of information regarding health, exposure, and risk assessments for toxic air pollutants.

EA EXPOSURE ASSESSMENT  
EPA ENVIRONMENTAL PROTECTION AGENCY  
HA HEALTH ASSESSMENT  
PD AT SUPPORT DOCUMENT  
RA RISK ASSESSMENT  
RDG REG DEVELOPMENT GUIDE

PB90-120148

MOBILE4 Exhaust Emission Factors and Inspection/Maintenance Benefits for Passenger Cars  
EPA, Ann Arbor, MI, TSS  
E.L. Glover and D.J. Brzezinski  
Aug 89, 66p, EPA-AA/TSS-IM-89-3, PC A04/MF A01

Abstract: The MOBILE4 Tech IV Credit Model is used to estimate the emission factor equations, the effects of Inspection and Maintenance (I/M) programs, and the bag fraction equations for 1981 and later passenger cars. The model's results are then stored in the EPA MOBILE4 emission factor model database. The report describes the development, use and results of the Tech IV model. It also documents the normalized bag fractions, high altitude emission factors, biennial I/M credits, and idle emission I/M credits used in MOBILE4.

EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY  
PP POLLUTION PREVENTION

PB90-120544

Draft Test Report: A Performance Test on a Spray Dryer, Fabric Filter, and Wet Scrubber System  
EPA, Washington, DC, OSW  
S. Garg  
Oct 89, 128p, EPA-530/SW-90-008, PC A07/MF A01

Abstract: The EPA's Office of Solid Waste (OSW) is currently developing regulations to control emissions of products of incomplete combustion, particulate matter and toxic metals from hazardous waste incinerators. Emissions data to support these regulations was collected and testing was conducted on a toxic substances control waste incinerator between 4/25-27/89. EPA's objectives were to collect particulate and metals removal efficiency and emissions data for the combined spray dryer and baghouse system and the total air pollution control system; characterize the fate of waste feed metals through the incineration and air pollution control systems; and evaluate the potential use of a surrogate metal 'soup' as a means of assessing control efficiencies and establishing allowable waste feed concentrations for toxic metals.

CL-METAL METALLIC COMPOUNDS  
CL-ORGANIC ORGANIC COMPOUNDS  
CL-PM PARTICULATE MATTER  
CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
SA SOURCE ASSESSMENT  
49 ELECTRIC, GAS, AND SANITARY SERVICES  
495 SANITARY SERVICES  
4953 REFUSE SYSTEMS

**PB90-127374**

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, June 1988

EPA, Research Triangle Park, NC, AREAL  
Engineering Science

W.T. Winberry, N.T. Murphy, and R.M. Riggan  
Jun 88, 600p, EPA-600/4-89-017, PC A25/MF A04

**Abstract:** The Compendium has been prepared to provide regional, State, and local environmental regulatory agencies, as well as other interested parties, with specific guidance on the determination of selected toxic organic compounds in ambient air. The decision was made to begin preparation of a Compendium which would provide specific sampling and analysis procedures, in a standardized format, for selected toxic organic compounds. The current Compendium consists of fourteen procedures which are considered to be of primary importance in current toxic organic monitoring efforts.

AM AMBIENT MONITORING  
CL-ORGANIC ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
95 ENVIRONMENTAL QUALITY AND HOUSING  
951 ENVIRONMENTAL QUALITY  
9511 AIR, WATER, & SOLID WASTE MANAGEMENT

**PB90-129362**

Pilot-Scale ESP (Electrostatic Precipitator) and Hydro-Sonic Scrubber Parametric Tests for Particulate, Metals and HCl Emissions

EPA, Washington, DC, OSW

S. Garg

Jun 89, 77p, EPA-530/SW-90-009, PC A05/MF A01

**Abstract:** The EPA's Office of Solid Waste is currently developing additional regulations to control emissions of particulate matter, toxic metals and hydrochloric acid (HCl) from hazardous waste incinerators. Emissions data was collected to support these regulations; testing was conducted on two pilot-scale air pollution control systems installed and operated in Tulsa, OK. The test program took place between March 28 and April 4, 1989. The report represents the results of the testing program and describes the processes involved as well as the testing and analytical methods used. The primary objective of the test program was to collect particulate and toxic metals removal efficiency and emissions data for two pilot-scale air pollution control systems--hydro-sonic wet scrubber; and beltran two-stage electrostatic precipitator.

CL-METAL METALLIC COMPOUNDS  
CL-PM PARTICULATE MATTER  
CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
NSPS NEW SRC PRFRNCE STD  
SA SOURCE ASSESSMENT  
49 ELECTRIC, GAS, AND SANITARY SERVICES  
495 SANITARY SERVICES  
4953 REFUSE SYSTEMS  
7647-01-0 HYDROGEN CHLORIDE

**PB90-134172**

Follow-Up Alpha-Track Monitoring in 40 Eastern Pennsylvania Houses with Indoor Radon Reduction Systems. (Winter 1988-89)

EPA, Research Triangle Park, NC, AEERL  
American ATCON, Inc.

A.G. Scott and A. Robertson

Oct 89, 27p, EPA-600/8-89-083, PC A03/MF A01

**Abstract:** The report gives results of 4-month-long alpha-track detector (ATD) measurements of indoor radon concentrations, completed during the winter of 1988-89 in 38 of 40 houses where radon reduction techniques had been installed 2-4 years previously during an earlier EPA project. The techniques, installed between June 1985 and June 1987, generally involved some form of active soil ventilation: three were air-to-air heat exchangers, and two involved carbon filters to remove radon from well water. The purpose of these measurements was to determine if the radon reduction performance of the systems had degraded compared to previous wintertime radon measurements. Comparison of the current ATD results with those from 1986-87 and 1987-88 indicates that, in the 34 houses where the system was in continuous operation during this measurement period, the radon levels generally compared well with those measured during the previous years. In only two houses did significant, unexplainable increases occur. Two soil ventilation fans failed during the previous year: 5 out of 34 fans have failed to date. One air-to-air heat exchanger has needed repair. The one water treatment unit designed specifically for radon removal is giving 97% removal, whereas the other has degraded to 65%.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON

**PB90-141227**

Surface Impoundment Modeling System (SIMS), User's Manual

EPA, Research Triangle Park, NC, CTC

Radian Corporation

S. Watkins

Sep 89, 40p, EPA-450/4-89-013A, PC A03/MF A01

**Abstract:** Surface impoundments are used to treat, store, and dispose of waste water generated by facilities in many different industries. The Surface Impoundment Modeling System (SIMS) is a personal computer based program designed to estimate the air emissions from surface impoundments. The emission estimates are based on mass transfer models developed by the Emissions Standards Division (ESD) of the EPA during the evaluation of hazardous waste treatment, storage, and disposal facilities (TSDF's). SIMS allows the user to specify all required inputs to these emission models when this information is available, or when only limited information is available, provides default values for most of the model inputs. The manual presents a complete reference for all of the features and commands in SIMS.

EPA ENVIRONMENTAL PROTECTION AGENCY  
SA SOURCE ASSESSMENT



**PB90-141235**

Background Document for the Surface Impoundment Modeling System (SIMS)  
EPA, Research Triangle Park, NC, CTC  
Radian Corporation  
S. Watkins  
Sep 89, 184p, EPA-450/4-89-013B, PC A09/MF A01

**Abstract:** Surface impoundments are used to treat, store, and dispose of waste water generated by facilities in many different industries. The Surface Impoundment Modeling System (SIMS) is a personal computer based program designed to estimate the air emissions from surface impoundments. The emission estimates are based on mass transfer models developed by the Emissions Standards Division (ESD) of the EPA during the evaluation of hazardous waste treatment, storage, and disposal facilities (TSDF's). SIMS allows the user to specify all required inputs to these emission models when the information is available, or when only limited information is available, provides default values for most of the model inputs. The manual presents a complete reference for all of the features and commands in SIMS.

EPA ENVIRONMENTAL PROTECTION AGENCY  
SA SOURCE ASSESSMENT

**PB90-143447**

Aerosol Industry Success in Reducing CFC (Chlorofluorocarbon) Propellant Usage  
EPA, Research Triangle Park, NC, AERL  
Radian Corporation  
T.P. Nelson and S.L. Wavill  
Nov 89, 227p, EPA-600/2-89-062, PC A11/MF A02

**Abstract:** The two-part report discusses the reduction of chlorofluorocarbon (CFC) propellant usage. Part I discusses the U.S. aerosol industry's experience in converting from CFC propellants to alternative aerosol formulations. Detailed examples of non-CFC formulations are provided for 28 categories of aerosol products. Hydrocarbon propellants, which cost less than CFCs, are most often selected as the propellants of choice unless special properties (e.g., increased solvency or reduced flammability) are needed. Dimethyl ether is the next most preferred CFC alternative although it is flammable and a strong solvent. Carbon dioxide, nitrous oxide, and nitrogen are inexpensive and widely available, but have been underused as aerosol propellants. Special equipment is often needed to add them to the aerosol containers.

CL-CFC CHLOROFLUOROCARBONS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
PP POLLUTION PREVENTION  
28 CHEMICALS AND ALLIED PRODUCTS  
283 DRUGS  
2834 PHARMACEUTICAL PREPARATIONS  
284 SOAP, CLEANERS, AND TOILET GOODS  
2844 TOILET PREPARATIONS  
73 BUSINESS SERVICES  
738 MISCELLANEOUS BUSINESS SERVICES  
7389 BUSINESS SERVICES, NEC

**PB90-145772**

Indoor Air: Reference Bibliography  
EPA, Research Triangle Park, NC, OAQPS  
D. Campbell, D. Staves, and S. McDonald  
Jul 89, 341p, EPA-600/8-89-067F, PC A15/MF A02

**Abstract:** The U.S. EPA initially established the indoor air Reference Bibliography in 1987 as an appendix to the Indoor Air Quality Implementation Plan. The document was submitted to Congress as required under Title IV--Radon Gas and Indoor Air Quality Research of the Superfund Amendments and Reauthorization Act of 1986. The Reference Bibliography is an extensive bibliography of reference materials on indoor air pollution. The Bibliography contains over 4500 citations and continues to increase as new articles appear.

CL-IAP INDOOR AIR POLLUTANTS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR

**PB90-146416**

Air Emissions Species Manual (Addendum to the)  
EPA, Research Triangle Park, NC, OAQPS  
Radian Corporation  
G.W. Brooks, J.T. Waddell, and A. Butler  
Oct 89, 311p, EPA-450/2-88-003C, PC A14/MF A02

**Abstract:** The U.S. EPA has several activities that require speciated particulate matter (PM) or volatile organic compound (VOC) profiles from several source categories. In an effort to update the available speciated PM profile data base, EPA has initiated studies to update various reference manuals. The document updates the PM profiles in the Air Emissions Species Manual, Volume II with new information obtained from contacts with principal researchers in the field of PM species profiles and source receptor modeling. The new profiles were developed using the procedures and protocols specified in the original Air Emissions Species Manual, Volume II. The profiles are based on data submitted by the researchers.

CL-PM PARTICULATE MATTER  
CL-VOC VOLATILE ORGANIC COMPOUNDS  
EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-146697**

Nonmethane Organic Compound Monitoring Program. Final Report 1988.  
Volume 2. Urban Air Toxics Monitoring Program  
EPA, Research Triangle Park, NC, OAQPS  
Radian Corporation  
R.A. McAllister, et al.  
Apr 89, 277p, EPA-450/4-89-005, PC A13/MF A02

Abstract: From October, 1987 to October, 1988 samples of ambient air were collected at 19 sites in the eastern part of the U.S. Every 12 days, air was integrated over 24-hour periods into passivated stainless steel canisters. Simultaneously, air was drawn through cartridges containing dinitrophenylhydrazine to collect carbonyl compounds. The samples were analyzed at a central laboratory for a total of 37 halogenated and aromatic hydrocarbons, formaldehyde, acetaldehyde, and other oxygenated species. The hydrocarbon species were analyzed by gas chromatography/multiple detectors and gas chromatography/mass spectrometry, while the carbonyl species were analyzed by liquid chromatography. An extensive quality assurance program was carried on to secure high quality data. Complete data for all the hydrocarbon samples are presented in the report.

AM AMBIENT MONITORING  
CL-ALDEHYD ALDEHYDES  
CL-NMHC NON-METHANE HYDROCARBONS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
50-00-0 FORMALDEHYDE  
75-07-0 ACETALDEHYDE

**PB90-149972**

Alternative Formulations to Reduce CFC (Chlorofluorocarbons) Use in U.S. Exempted and Excluded Aerosol Products  
EPA, Research Triangle Park, NC, AEERL  
Radian Corporation  
T.P. Nelson and S.L. Wevill  
Nov 89, 155p, EPA-600/2-89-061

Abstract: The report examines products exempted and excluded from those affected by the 1978 ban on the use of chlorofluorocarbons (CFCs) as aerosol propellants, the present consumption of CFCs still utilized for these products in the U.S., and alternative formulations which may be used to reduce or eliminate the CFC content of these products. (NOTE: The ban allowed for exemptions if it could be demonstrated that no acceptable alternative propellants were available and that the products were essential. Essentiality was based on three criteria: (1) the product's economic significance, (2) the environmental and health impacts of the product and its substitutes, and (3) the effects on the quality of life resulting from no longer having the product or a reasonable substitute available. Also, if a CFC served some purpose other than as a propellant, that product was excluded from the regulation.) The study shows that about 40% of the CFC usage in these products can be immediately replaced by available substitutes. It identified seven categories of products for which immediate replacement of all of the CFC content is not technically feasible.

CL-CFC CHLOROFLUOROCARBONS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
PP POLLUTION PREVENTION

**PB90-151457**

Effects of Appliance Type and Operating Variables on Woodstove Emissions. Volume 1. Report and Appendices A-C  
EPA, Research Triangle Park, NC, AEERL  
OMNI Environmental Services, Inc.  
P.C. Burnet, J.E. Houck, and R.B. Roholt  
Jan 90, 136p, EPA-600/2-90-001A, PC A07/MF A01

Abstract: The report gives results of a project, in support of the integrated Air Cancer Project (IACP), to provide data on the specific effects of appliance type and operating variables on woodstove emissions. Samples of particulate material and volatile organic compounds (VOCs) were collected. Particulate samples were analyzed for different organic fractions including specific polynuclear aromatic hydrocarbon (PAH) compounds. Inorganic matter on the filters was also analyzed. Results were calculated for pollutant concentrations, emission rates, and emission factors. Twelve test runs were conducted on a conventional stove, and two on a catalyst-equipped stove. Operating variables included fuel type (oak and pine), altitude (80 and 800 m), and burn rate (high and low). Test data were analyzed using analysis of variance and linear regression procedures. Although the data do not show strong statistical significance due to variability of results, some general trends do appear to be present, and conclusions can be drawn as to the effects of various operating variables on woodstove emissions.

CL-PAH POLYCYCLIC AROMATIC HYDROCARBONS  
CL-PM PARTICULATE MATTER  
CL-VOC VOLATILE ORGANIC COMPOUNDS  
EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY  
SS SOURCE SAMPLING

**PB90-151465**

Effects of Appliance Type and Operating Variables on Woodstove Emissions. Volume 2. Appendices D-F  
 EPA, Research Triangle Park, NC, AEERL  
 OMNI Environmental Services, Inc.  
 P.G. Burnet, J.E. Houck, and R.B. Roholt  
 Jan 90, 266p, EPA-600/2-90-001B, PC A12/MF A02

**Abstract:** The report gives results of a project, in support of the Integrated Air Cancer Project (IACP), to provide data on the specific effects of appliance type and operating variables on woodstove emissions. Samples of particulate material and volatile organic compounds (VOCs) were collected. Particulate samples were analyzed for different organic fractions including specific polynuclear aromatic hydrocarbon (PAH) compounds. Inorganic matter on the filters was also analyzed. Results were calculated for pollutant concentrations, emission rates, and emission factors. Twelve test runs were conducted on a conventional stove, and two on a catalyst-equipped stove. Operating variables included fuel type (oak and pine), altitude (80 and 800 m), and burn rate (high and low). Test data were analyzed using analysis of variance and linear regression procedures. Although the data do not show strong statistical significance due to variability of results, some general trends do appear to be present, and conclusions can be drawn as to the effects of various operating variables on woodstove emissions.

CL-PAH	POLYCYCLIC AROMATIC HYDROCARBONS
CL-PM	PARTICULATE MATTER
CL-VOC	VOLATILE ORGANIC COMPOUNDS
EF	EMISSION FACTOR
EPA	ENVIRONMENTAL PROTECTION AGENCY
SS	SOURCE SAMPLING

**PB90-152224**

Nonoccupational Pesticide Exposure Study (NOPES)  
 EPA, Research Triangle Park, NC, AREAL  
 Research Triangle Inst.  
 F.W. Immerman and J.L. Schaum  
 Jan 90, 256p, EPA-600/3-90-003, PC A12/MF A02

**Abstract:** The Non-occupational Pesticide Exposure Study was the first attempt to develop a methodology for measuring the potential exposure of specified populations to common pesticides. In the study, as in other studies utilizing the Total Exposure Assessment Methodology (TEAM), the exposures were related to actual use patterns. A selected list of 32 household pesticides were evaluated in two different cities during the study. Air samples were collected over a 24-hour period in indoor, outdoor and personal microenvironments. In addition, limited water and dermal contact samples were collected for selected homes. The study households were selected from stratified random population samples in two urbanized areas. The samples were collected over several seasons in areas contrasting a relatively high and low use of pesticides. Dietary recall, activity pattern, and pesticide use data were collected through survey questionnaires. The report discusses the results of the study with an emphasis on the various routes of exposure (air, water, dermal, and indirectly, food) and their relative contribution to total human exposure.

AM	AMBIENT MONITORING
CL-PEST	PESTICIDES
EA	EXPOSURE ASSESSMENT
EPA	ENVIRONMENTAL PROTECTION AGENCY

**PB90-154832**

Municipal Waste Combustors--Background Information for Proposed Standards  
 EPA, Research Triangle Park, NC, OAQPS  
 Radian Corporation  
 Aug 89, 1237p in 5 volumes, EPA-450/3-89-027A-E, PC E99/MF E99

**Abstract:** Set includes PB90-154840 through PB90-1548815: Volume 1 - Cost Procedures (PB90-154840, PC A08/MF A01). Volume 2 - 111(b) Model Plant Description and Cost Report (PB90-154857, PC A07/MF A01). Volume 3 - Post-Combustion Technology Performance (PB90-154865, PC A14/MF A01). Volume 4 - Control of NOx Emissions (PB90-154873, PC A06/MF A01). Volume 5 - Guidelines for Existing Facilities (PB90-154881, PC A22/MF A01).

EPA	ENVIRONMENTAL PROTECTION AGENCY
NSPS	NEW SRC PERFRMCE STD
11104-93-1	NITROGEN OXIDES
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS

PR90-154907

**Economic Impact of Air Pollutant Emission Standards for New Municipal Waste Combustors**

EPA, Research Triangle Park, NC, OAQPS

Research Triangle Inst.

G.E. Morris, et al.

Aug 89, 166p, EPA-450/3-89-006, PC A08/MF A01

**Abstract:** The U.S. EPA plans to propose New Source Performance Standards (NSPSs) for air emissions from new municipal waste combustors (MWCs) in late 1989. Affected plants include all MWC plants that are placed under construction after regulations are proposed in the Federal Register. The regulations will affect the number of plants built and the combustion technology selected. The regulations will also significantly affect the cost of owning and operating these new plants. The report uses three economic scenarios to examine the economic impact of the five regulatory alternatives under most active consideration by EPA.

EPA	ENVIRONMENTAL PROTECTION AGENCY
NSPS	NEW SRC PRFRMCE STD
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS

PR90-154915

**Municipal Impact Analysis of Air Pollutant Emission Standards and Guidelines for Municipal Waste Combustors**

EPA, Research Triangle Park, NC, OAQPS

J. Robson, B. Madariaga, and T. Walton

Oct 89, 171p, PC A08/MF A01

**Abstract:** The EPA, under the authority of Clean Air Act 111(b) and (d), proposes to regulate air pollutant emissions from new and existing municipal waste combustors (MWCs). MWC emissions cause, or contribute significantly to, air pollution that endangers public health and welfare. The Standards and Guidelines require the reduction of emissions to the air of organic compounds (principally dioxins and furans), metals (cadmium, mercury, chromium, lead, nickel, etc.), acid gases (sulfur dioxide, hydrogen chloride, etc.), nitrogen oxides, and carbon monoxide. The Standards identify these pollutants as MWC emissions and nitrogen oxides. MWC emissions consist of MWC organics, MWC metals, and MWC acid gases. MWC emissions is the designated pollutant that triggers application of 111(d); the Guidelines do not address nitrogen oxides. Currently, EPA new source review permitting directives to the states recommend control of most of these pollutants at new, large MWCs.

CL-ACID	ACIDIC COMPOUNDS INCLUDING ACID GASES
CL-DIOXIN	DIOXINS
CL-FURAN	FURANS
CL-LEAD	LEAD COMPOUNDS
CL-METAL	METALLIC COMPOUNDS
EPA	ENVIRONMENTAL PROTECTION AGENCY
NSPS	NEW SRC PRFRMCE STD
11104-93-1	NITROGEN OXIDES
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS
630-08-0	CARBON MONOXIDE
7439-97-6	MERCURY
7440-02-0	NICKEL
7440-43-9	CADMIUM
7440-47-3	CHROMIUM
7446-09-5	SULFUR DIOXIDE
7647-01-0	HYDROGEN CHLORIDE

**PB90-155573**

Characterization of Population and Usage of Unvented Kerosene Space Heaters

EPA, Research Triangle Park, NC, AERL

Applied Management Sciences, Inc.

J. Barnes, P. Holland, and P. Muhlmeister

Jan 90, 75p, EPA-600/7-90-004, PC A04/MF A01

**Abstract:** The report gives results of a study of the market penetration of unvented kerosene space heaters (UKSHs) in the residential sector. The study was aimed at gathering baseline information to help assess the magnitude and potential severity of a problem involving emissions from unvented appliances, one of a number of synergistic factors affecting indoor air quality. UKSHs can be a significant source of such emissions. UKSH usage patterns were also investigated. Annual sales of UKSHs are estimated at 825,000 units. Leading brands include convective units marketed by Toyotomi USA (kero-Sun) and Corona USA. Some units contain built-in catalytic filters for odor control. Add-on catalytic filters are available from at least one manufacturer. It is believed that 15-17 million portable UKSHs have been sold in the U.S. since the early 1970s. However, it is estimated that, in the 1986-87 heating season, there were only about 7 million units in use. About half of these units are in the South. Depending on whether UKSHs are used as primary or secondary heating sources, they may be used anywhere from 1 to 17 hours a day. Eighty percent of UKSHs are used in multifamily dwellings and mobile homes.

EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR

**PB90-160086**

Radon Reduction Techniques in Schools: Interim Technical Guidance

EPA, Washington, DC, ORP

Oct 89, 56p, EPA-520/1-89-020, PC A04/MF A01

**Abstract:** The guidance contained in the document is based largely on research conducted in 1987 and 1988 in schools located in Maryland and Virginia. Because school design, construction and operation patterns vary considerably, it is not always possible to recommend 'standard' corrective actions that apply to all schools. Therefore, the document covers background information on radon and radon mitigation experience, important school building characteristics relative to radon entry and mitigation, problem analysis, radon diagnostic testing, and radon mitigation system design and installation.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON  
15 GENERAL BUILDING CONTRACTORS  
154 NONRESIDENTIAL BUILDING CONSTRUCTION  
1542 NONRESIDENTIAL CONSTRUCTION, NEC  
82 EDUCATIONAL SERVICES  
821 ELEMENTARY AND SECONDARY SCHOOLS  
8211 ELEMENTARY AND SECONDARY SCHOOLS

**PB90-161514**

Chromium Emissions from Comfort Cooling Towers: Background Information for Promulgated Standards

EPA, Research Triangle Park, NC, OAQPS

Jan 89, 90p, EPA-450/3-87-010B, PC A05/MF A01

**Abstract:** A final rule for the control of hexavalent chromium emissions from comfort cooling towers (CCT) is being promulgated under authority of Section 6 of the Toxic Substances Control Act. The final rule prohibits both the use of Cr(+6) in CCTs and the distribution in commerce of Cr(+6) for use in CCTs. The rule would apply to existing and new CCTs. The document contains a summary of changes to the rule made since proposal, a summary of the impacts of the promulgated rule, and a summary of the public comments on the proposed rule and EPA's responses.

EPA ENVIRONMENTAL PROTECTION AGENCY  
NSPS NEW SRC PERFORMANCE STD  
7440-47-3 CHROMIUM

**PB90-169954**

OAQPS (Office of Air Quality Planning and Standards) Control Cost Manual (Fourth Edition)

EPA, Research Triangle Park, NC, OAQPS

W.M. Vataavuk

Jan 90, 282p, EPA-450/3-90-006, PC A13/MF A02

**Abstract:** The Manual compiles up-to-date capital costs, operating and maintenance expenses, and other costs for 'add-on' air pollution control systems and provides a comprehensive, concise, consistent, and easy-to-use procedure for estimating and (where appropriate) escalating these costs. ('Add-on' systems are those installed downstream of an air pollution source to control its emissions). The Manual estimating procedure rests on the notion of the 'factored' or 'study' estimate, nominally accurate to within + or - 30%. This type of estimate is well suited to estimating control system costs intended for use in regulatory development. Study estimates are sufficiently accurate, yet do not require the detailed, site-specific data inputs needed to make definitive or other more accurate types of estimates.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
RDG REG DEVELOPMENT GUIDE

**PB90-171778**

Guidelines for Conducting the AHERA (Asbestos Hazard Emergency Response Act) TEM (Transmission Electron Microscopy) Clearance Test to Determine Completion of an Asbestos Abatement Project  
EPA, Washington, DC, OTS  
Chesson Consulting  
J. Chesson, et al.  
May 89, 31p, EPA-560/5-89-001, PC A03/MF A01

**Abstract:** Asbestos abatement carried out in schools is subject to regulations under the Asbestos Hazard Emergency Response Act of 1986 (AHERA). The AHERA rule (40 CFR Part 763) includes procedures for determining when an asbestos abatement site is sufficiently clean for the containment barriers to be removed. After the abatement site has been subject to a thorough visual inspection, air samples are collected. In most cases, the samples must be analyzed by transmission electron microscopy (TEM). The document provides guidance for conducting the TEM clearance test with emphasis on interpretation of the results. The three components of the test, the Initial Screening Test, the Blank Contamination Test, and the Z-test, are described and illustrated with numerical examples.

EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
PP POLLUTION PREVENTION  
1332-21-4 ASBESTOS  
82 EDUCATIONAL SERVICES  
821 ELEMENTARY AND SECONDARY SCHOOLS  
8211 ELEMENTARY AND SECONDARY SCHOOLS

**PB90-173469**

**Inside Story: A Guide to Indoor Air Quality - How Well Is It Working.**  
Risk Communication Series  
EPA, Washington, DC, OPPE  
D. Synstelien  
Jan 90, 56p, EPA-230/01-90-073, PC A04/MF A01

**Abstract:** The U.S. EPA and the U.S. Consumer Product Safety Commission developed a booklet entitled 'The Inside Story: A Guide to Indoor Air Quality,' designed to provide information for the general public. The report describes the small scale evaluation of the effectiveness of the booklet. The study appears to be one of the first attempts to determine how information materials requested by households actually are used by them. The evaluation examined the share of requesters who read the booklet; changes in their knowledge about indoor air pollution causes, and knowledge about testing and mitigation. The evaluation also asked whether respondents had tested or taken action to reduce their exposure to indoor air pollution.

CL-IAP INDOOR AIR POLLUTANTS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
RC RISK COMMUNICATION

**PB90-178302**

Communicating Radon Risk Effectively: A Mid-Course Evaluation  
EPA, Washington, DC, OPA  
V.K. Smith, et al.  
Jul 87, 244p, EPA-230/07-87-029, PC A11/MF A02

**Abstract:** A panel of 2300 homeowners was divided into subgroups to test the effectiveness of six alternative ways of explaining the risk from naturally occurring radon gas. The research design focused on two dimensions: Qualitative vs. quantitative and directive vs. evaluative. These characteristics led to 4 experimental booklets, which were compared with EPA's Citizen's Guide and a one-page fact sheet. The evaluation examined how much people learned about radon; whether they could form risk perceptions consistent with their home's measured radon level; and whether they felt they had enough information to make a decision about mitigation. The fact sheet did not perform well on any of these evaluation criteria. None of the five booklets clearly was best for all 3 evaluation criteria; the report discusses the implications for designing an effective radon risk communication program.

EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
RC RISK COMMUNICATION  
10043-92-2 RADON

**PB90-182197**

Environmental Radiation Data: Report 58, April-June 1989  
EPA, Montgomery, AL, EERF  
Dec 89, 45p, EPA-520/5-89-034, PC A03/MF A01

**Abstract:** Environmental Radiation Data (ERD) contains data from the Environmental Radiation Ambients Monitoring System (ERAMS). Data from similar networks operated by contributing States, Canada, Mexico, and the Pan American Health Organization are reported in the ERD when available. The ERAMS is comprised of nationwide sampling stations that provide air, surface, and drinking water and milk samples from which environmental radiation levels are derived. Sampling locations are selected to provide optimal population coverage while functioning to monitor fallout from nuclear devices and other forms of radioactive contamination of the environment. The radiation analyses performed on these samples include gross alpha and gross beta levels, gamma analyses for fission products, and specific analyses for uranium, plutonium, strontium, iodine, radium, krypton, and tritium.

AM AMBIENT MONITORING  
CL-RAD RADIATION  
EPA ENVIRONMENTAL PROTECTION AGENCY  
SS SOURCE SAMPLING  
7440-07-5 PLUTONIUM  
7440-14-4 RADIUM  
7440-24-6 STRONTIUM  
7440-61-1 URANIUM  
7553-56-2 IODINE

**EB90-182544**

Air/Superfund National Technical Guidance Series. Superfund Air Pathway Analyses Review Criteria Checklists  
EPA, Research Triangle Park, NC, OAQPS  
Radian Corp.  
J.E. Letkeman  
Jan 90, 63p, EPA-450/1-90-001, PC A04/MF A01

**Abstract:** The EPA has responsibility for assessment and clean-up of Superfund sites. Because air emissions pose a potential human health risk at these sites, the EPA has developed a set of procedures for evaluating these risks. The four checklists presented provide a systematic approach for air reviewers to apply the air pathway assessment procedures. The background, purpose, and application of the checklists are discussed.

EPA ENVIRONMENTAL PROTECTION AGENCY  
RA RISK ASSESSMENT

**EB90-182759**

Handbook: Hazardous Waste Incineration Measurement Guidance Manual. Volume 3 of the Hazardous Waste Incineration Guidance Series  
EPA, Washington, DC, OSWER  
Jun 89, 52p, EPA-625/6-89-021, PC A04/MF A01

**Abstract:** The document provides general guidance to permit writers in reviewing the measurement aspects of incineration permit applications and trial burn plans. It is oriented to how measurements are made, not what measurements to make. The guidance deals specifically with commonly required measurement parameters and measurement methods for process monitoring, sampling and analysis aspects of trial burns and subsequent operation of the incinerator, and quality assurance/quality control (QA/QC) associated with these activities. As a guidance tool, the document introduces the major elements of incineration measurements via sample checklists, general discussion, and technical references.

EPA ENVIRONMENTAL PROTECTION AGENCY  
SS SOURCE SAMPLING  
49 ELECTRIC, GAS, AND SANITARY SERVICES  
495 SANITARY SERVICES  
4953 REFUSE SYSTEMS

**EB90-184367**

Air Emissions Species Manual. Volume 2. Particulate Matter Species Profiles. Second Edition  
EPA, Research Triangle Park, NC  
Radian Corporation  
G.W. Brooks, J.T. Waddell, and W.A. Butler  
Jan 90, 784p, EPA-450/2-90-001B, PC A99/MF E06

**Abstract:** The U.S. Environmental Protection Agency (EPA) has several activities that require speciated particulate matter (PM) or volatile organic compound (VOC) profiles from several source categories. In an effort to update the available speciated PM profile data base, EPA initiated studies to update the 'Receptor Model Source Composition Library' (EPA-450/4-85-002) and produce a revision entitled 'Air Emissions Species Manual - Volume II, Particulate Matter Species Profiles' (EPA-450/2-88-003b). Similarly for VOC emissions, EPA performed studies to revise the 'Volatile Organic Compound Species Data Manual - Second Edition' (EPA-450/4-80-015) and provide an updated version in the 'Air Emissions Species Profiles' (EPA-450/2-88-003a). The purpose of the document is to update the PM profiles in the Air Emissions Species Manual, Volume II with new information obtained from contacts with principal researchers in the field of PM species profiles and source receptor modeling. The profiles are based on data voluntarily submitted by the researchers.

CL-PM PARTICULATE MATTER  
EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY

**EB90-185422**

Compiling Air Toxics Emission Inventories. Second Edition  
EPA, Research Triangle Park, NC, OAQPS  
D.W. Safriet  
Feb 90, 80p, EPA-450/4-86-010, PC A05/MF A01

**Abstract:** The report contains technical materials that will assist State and local control agencies in compiling air toxics emission inventories. It contains a discussion of various considerations that should be made in planning and beginning an inventory and various tools an agency can use to locate potential sources and to estimate emissions therefrom. The appendices contain the data needed to use these inventory tools and some example applications of them.

CL-HAPS TITLE III HAZARDOUS AIR POLLUTANTS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
RDG REG DEVELOPMENT GUIDE  
SA SOURCE ASSESSMENT  
95 ENVIRONMENTAL QUALITY AND HOUSING  
951 ENVIRONMENTAL QUALITY  
9511 AIR, WATER, & SOLID WASTE MANAGEMENT

**PB90-185844**

Air Emissions Species Manual. Volume 1. Volatile Organic Compound Species Profiles. Second Edition  
EPA, Research Triangle Park, NC  
Radian Corporation  
G.W. Brooks, J.T. Waddell, and W.A. Butler  
Jan 90, 640p, EPA-450/2-90-001A, PC A99/MF A04

Abstract: The U.S. EPA has several activities that require speciated particulate matter (PM) or volatile organic compounds (VOC) profiles from several source categories. In an effort to update the available speciated PM profile data base, EPA initiated studies to update the 'Receptor Model Source Composition Library' and produce a revision entitled 'Air Emissions Species Manual - Volume II, Particulate Matter Species Profiles'. Similarly for VOC emissions, EPA performed studies to revise the 'Volatile Organic Compound Species Data Manual - Second Edition' and provide an updated version in the 'Air Emissions Species Manual - Volume I, Volatile Organic Compound Species Profiles'. The purpose of the document is to update VOC profiles in the Air Emissions Species Manual, Volume I.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-186313**

Estimation of Emissions from Charcoal Lighter Fluid and Review of Alternatives  
EPA, Research Triangle Park, NC, AERL  
Radian Corporation  
D.L. Campbell, and M.B. Stockton  
Jan 90, 40p, EPA-600/2-90-003, PC A03/MF A01

Abstract: The report gives results of an evaluation of emissions of volatile organic compounds (VOCs) from charcoal lighter fluid, a consumer product consisting entirely of volatile constituents. An estimated 46,250 tons (42,000 Mg) of charcoal lighter fluid is used in the U.S. each year. VOCs contribute to the formation of ozone; therefore, the ozone nonattainment issue has focused attention on VOCs emitted from many sources. VOCs are emitted when charcoal lighter fluid is used, but these emissions are difficult to quantify. Evaporative VOC losses occur from the lighter fluid prior to ignition, and combustion VOC losses occur from burning lighter-fluid-soaked charcoal briquettes. The study evaluates tests conducted to date on charcoal lighter fluid emissions. The information is most complete for evaporative VOC losses. The estimates vary greatly, however, based on the length of time between application of the lighter fluid and ignition. The limited tests conducted to date have not distinguished lighter fluid from charcoal briquette combustion emissions.

CL-CONSUMER CONSUMER PRODUCTS  
CL-VOC VOLATILE ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
SA SOURCE ASSESSMENT

**PB90-186370**

Remote Sensing of Hydrocarbons and Toxic Pollutants: Workshop Minutes. Held in Las Vegas, Nevada on April 6-7, 1989  
EPA, Las Vegas, NV, EMSL  
Nevada Univ., Las Vegas  
F.F. Hall  
Mar 90, 71p, EPA-600/9-90-009, PC A04/MF A01

Abstract: A number of remote sensing techniques are now available for monitoring hydrocarbons and toxic airborne pollutants. Filter and dispersive spectroradiometers (line integral in ppb range; cost about \$35K) with restricted versatility are sold commercially. The more versatile FTIR's (line integral in ppb range; cost \$50-100K) and DIAL's (range-resolve in ppm range; cost \$100-200K) are now becoming commercially available. Automatic, unattended field operation has been successfully demonstrated for several types of such adaptable remote sensing systems. FTIR's and DIAL's complement each other in identifying a pollutant's presence and its spatial extent; there is potential for improving their performance by a factor of ten or more in the next ten years. Much of the promise for FTIR's lies in their reliance on computer software and hardware to perform the frequency analyses and to access the stored libraries of reference spectra. If avalanche photodiodes for the thermal infrared can be made feasible for field work, there is a potential for an additional order of magnitude or more of performance improvement. Rapid line-tuning will be easier as the development of optical modulators for the infrared progresses.

AM AMBIENT MONITORING  
CL-HCARB HYDROCARBONS  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-186438**

Neurotoxic Effects of Controlled Exposure to a Complex Mixture of Volatile Organic Compounds  
EPA, Research Triangle Park, NC, HERL  
D.A. Otto, et al.  
Mar 90, 105p, EPA-600/1-90-001, PC A06/MF A01

Abstract: Subjective reactions of discomfort, impaired air quality, irritation of mucosal membranes, and impaired memory have been reported in chemically sensitive subjects during exposure to VOCs found in new buildings. 66 normal healthy male subjects aged 18-39 were exposed for 2.75 hrs to a complex VOC mixture at 0 and 25 mg/cu m. Each subject completed control and exposure sessions at one week intervals in counterbalanced order. Measurements included comfort ratings of eye, nose and throat irritation, symptom questionnaire and computerized behavioral tests. Subjects found the odor of VOCs unpleasant and strong and reported that VOC exposure degraded air quality, increased headache and produced general discomfort. VOC exposure did not affect performance on any behavioral tests. Results indicate that subjective reactions to VOCs are not limited to chemically sensitive individuals since the study population is a subgroup that is probably least likely to be affected by chemical exposure.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR



**PB90-187014**

Technical Assistance Document for Sampling and Analysis of Toxic Organic Compounds in Ambient Air  
EPA, Research Triangle Park, NC, AREAL  
ATC, Inc.  
D. Elam  
Feb 90, 133p, EPA-600/8-90-005, PC A07/MF A01

**Abstract:** The guidance document was originally issued in June 1983. Since then significant changes have occurred in the regulations that cover volatile and semivolatile organic air pollutants. There have also been significant advances in the collection and analysis of organic compounds and in the quality and availability of calibration and QC samples for them. The present version of the guidance document has been revised to reflect these changes so that the new information can be readily available to the monitoring community. Because the document covers regulatory issues, sampling and analytical methods, monitoring plan development and quality assurance it will be useful to both governmental and industrial personnel concerned with monitoring the ambient air for organic compounds. It should be useful as an aid for planning and establishing such air monitoring programs, but it should not be used as the sole source for such a program.

CL-SVOC	SEMIVOLATILE ORGANIC COMPOUNDS
CL-VOC	VOLATILE ORGANIC COMPOUNDS
EPA	ENVIRONMENTAL PROTECTION AGENCY
RDG	REG DEVELOPMENT GUIDE
SS	SOURCE SAMPLING

**PB90-187055**

Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions  
EPA, Cincinnati, OH, ECAO  
Jan 90, 439p, EPA-600/6-90-003, PC A19/MF A03

**Abstract:** The methodology document seeks to provide risk assessors with the guidance necessary to estimate the health risks that result from exposure to toxic pollutants in combustor emissions by pathways other than inhalation. The organization of the document reflects the four-step process of risk assessment (hazard identification, dose-response assessment, exposure assessment and risk characterization). The methodology is not intended to be prescriptive; that is, it does not comprise a set of guidelines or recommended approaches that the U.S. EPA believes should be applied in all circumstances. Rather, it provides a set of procedures that the risk assessor can draw upon, where applicable, to a given assessment. The document describes analytical procedures and computer models that can be used to estimate exposure and risk by a variety of environmental pathways. In addition, it serves as a preliminary source of data for carrying out the risk calculations. The degree of scientific support or uncertainty attendant to each calculation varies widely. Therefore, the appropriate use of these procedures and the discussion of uncertainties surrounding the results remain important responsibilities of the risk assessor.

EPA	ENVIRONMENTAL PROTECTION AGENCY
RA	RISK ASSESSMENT

**PB90-187949**

National Radon Measurement Proficiency (RMP) Program: Cumulative Proficiency Report, January 1990  
EPA, Washington, DC, ORP  
Research Triangle Inst.  
Jan 90, 382p, EPA-520/1-90-001, PC A17/MF A02

**Abstract:** The report is a complete listing of participants who met EPA's National Radon Measurement Proficiency (RMP) Program requirements during Test Round 6 conducted March-December 1989. It is intended for use by Federal, State, and local officials, radon measurement companies, radon mitigation contractors, concerned homeowners, and other persons as an aid in selecting reliable sources of radon measurement services.

EPA	ENVIRONMENTAL PROTECTION AGENCY
IA	INDOOR AIR
10043-92-2	RADON
17	SPECIAL TRADE CONTRACTORS
179	MISC. SPECIAL TRADE CONTRACTORS
1799	SPECIAL TRADE CONTRACTORS, NEC

**PB90-188905**

Test and Evaluation of a Polymer Membrane Preconcentrator  
EPA, Research Triangle Park, NC, AERL  
Radian Corp.  
K.E. Hummel and T.P. Nelson  
Apr 90, 171p, EPA-600/2-90-016, PC A08/MF A01

**Abstract:** The report gives results of an evaluation of the applicability of membrane systems as a preconcentrator and defines operating parameters of a membrane system. Advantages of such a system are potential reductions in cost for subsequent control systems. The evaluation is part of a joint EPA/California Air Resources Board investigation of the potential of membrane technology on VOC emissions. Tests of various membrane materials and configurations have been conducted. The polymeric membrane has been used for a number of years as a concentrating step for various liquid and gaseous streams, including the removal of large molecule organics from waste water streams, hydrogen separation, and CO<sub>2</sub> recovery. A polymer membrane is an ultra-thin layer of a selective polymer, supported on a porous sublayer. The membrane (active layer) selectively filters the pollutant molecules. A potentially innovative application of membrane technology may be to concentrate VOCs from exhaust gases such as solvent oven-drying exhaust. A preconcentrator membrane could be used to reduce the size and, in turn, the capital and operating costs of a conventional VOC control device such as a carbon adsorber or incinerator. Study results do not, however, verify that a membrane preconcentrator is a viable option to reduce overall pollution control costs.

CL-SOLVENT	SOLVENTS
CL-VOC	VOLATILE ORGANIC COMPOUNDS
CT	CNTRL TECHNOLOGY DOC
EPA	ENVIRONMENTAL PROTECTION AGENCY

**PB90-192006**

Field Evaluation of a High Volume Surface Sampler for Pesticides in Floor Dust

EPA, Research Triangle Park, NC, AREAL

Research Triangle Inst.

W.T. Budd, J.W. Roberts, and M.G. Ruby

Mar 90, 54p, EPA-600/3-90-030, PC A04/MF A01

**Abstract:** House dust and the pollutants carried with it are important contributors to total exposure through ingestion, inhalation, and skin penetration, especially for small children. Pesticides may be one of the more important contaminants of house dust. The report describes a pilot study conducted in 9 homes in Jacksonville, Florida, which provides preliminary information on the pesticide content of floor dust. Both the questionnaire developed for the Nonoccupational Pesticide Exposure Study (NOPES) and a supplemental questionnaire were administered in each household to develop information on pesticide usage and other variables that might be related to the floor dust samples. All samples were collected from carpeted surfaces. The samples were analyzed for 33 pesticides by GC/ECD and GC/MS following the NOPES standard procedures. On average, 7 to 8 target pesticides were observed in the indoor air samples and 11 to 12 in the floor dust. The most consistently observed pesticides were chlorpyrifos, with a median concentration of about 5 ppm in the dust, and chlordane, with a median concentration of approximately 6 ppm.

CL-PEST	PESTICIDES
EPA	ENVIRONMENTAL PROTECTION AGENCY
IA	INDOOR AIR
2921-88-2	CHLORPYRIFOS
57-74-9	CHLORDANE

**PB90-192014**

Field Demonstration for Mobile FT-IR for Detection of Volatile Organic Chemicals

EPA, Las Vegas, NV, EMSL

W.G. Fateley, R.M. Hammaker, and D.F. Gurka

Mar 90, 116p, EPA-600/4-90-008, PC A06/MF A01

**Abstract:** A mobile laboratory is now available to measure toxic compounds in the atmosphere. The mobility of the unit allows access to many sites in the continental United States. When the laboratory arrives at a designated site, a high resolution Fourier transform (FT-IR) instrument is used to measure the toxic materials, or volatile organic compounds, in the atmosphere. The site could be a landfill, lagoon, industrial site, chemical spill or any area where atmospheric pollution occurs. The FT-IR instrument is capable of identifying and quantifying atmospheric molecules at the parts per billion (ppb) level. The path observed by the instrument could be as small as a few meters, or as large as 600 meters in length, nearly 2,000 feet.

AM	AMBIENT MONITORING
CL-VOC	VOLATILE ORGANIC COMPOUNDS
EPA	ENVIRONMENTAL PROTECTION AGENCY

**PB90-192790**

Guides to Pollution Prevention: The Pesticide Formulating Industry

EPA, Cincinnati, OH, RREL

Jacobs Engineering Group, Inc.

Feb 90, 61p, EPA-625/7-90-004, PC A04/MF A01

**Abstract:** Pesticide formulating facilities generate wastes during such operations as decontamination of mixing and storage equipment, housekeeping, and laboratory testing for quality assurance. The wastes generated are: containers with leftover raw materials, pesticide dust and scrubber water from air pollution control equipment, volatile organic compounds, off-specification products and laboratory analysis wastes, spills, waste sands or clays, waste rinse water and solvent, laundry wastewater, and stormwater run-off contaminated with pesticides. Reducing the generation of these wastes at the source, or recycling the wastes on- or off-site, will benefit pesticide manufacturers by reducing raw material needs, reducing disposal costs, and lowering the liabilities associated with hazardous waste disposal.

CL-PEST	PESTICIDES
EPA	ENVIRONMENTAL PROTECTION AGENCY
PP	POLLUTION PREVENTION
28	CHEMICALS AND ALLIED PRODUCTS
287	AGRICULTURAL CHEMICALS
2879	AGRICULTURAL CHEMICALS, NEC

**PB90-192915**

Current Intelligence Bulletin 53. Toluene Diisocyanate (TDI) and Toluenediamine (TDA): Evidence of Carcinogenicity

NIOSH

Dec 89, 29p, DHHS/PUB/NIOSH-90-101, PC A03/MF A01

**Abstract:** Experimental studies in animals have demonstrated that toluene diisocyanate (TDI) is a carcinogen. When rats and mice were exposed orally to commercial-grade TDI (an 80:20 mixture of 2,4- and 2,6-TDI), tumors were induced in both species. The systemic nature of TDI carcinogenicity was demonstrated by the appearance of tumors at multiple sites (pancreas, liver, skin, mammary glands, and circulatory system). Although not statistically significant, rare brain tumors were found in rats exposed to TDI (two gliomas and one pinealoma). Historical controls have a low incident of gliomas and no reported incidence of pinealomas. Experimental studies in animals have also demonstrated that 2,4-toluenediamine (TDA), an hydrolysis product of 2,4-TDI, is a carcinogen. When rats and mice were exposed orally to TDA, tumors were induced in the liver, skin, and mammary glands of both species. The potential for TDI- or TDA-induced cancer in humans has not been determined, but the risk of developing cancer should be decreased by reducing exposure to TDI and TDA in the workplace.

NIOSH	NATIONAL INSTITUTE FOR OCCUP. SAFETY AND HEALTH
TT	TOXICITY TESTING
26471-62-5	TOLUENE DIISOCYANATE

**PB90-194754**

Industrial Wastewater Volatile Organic Compound Emissions. Background Information for BACT/LAER Determinations.  
EPA, Research Triangle Park, NC  
Radian Corporation  
J. Elliott and S. Watkins  
Jan 90, 402p, EPA-450/3-90-004, PC A18/MF A03

**Abstract:** The purpose of the Control Technology Center (CTC) is to provide technical information to States on estimating and controlling volatile organic compounds (VOC) emissions from the collection and treatment of industrial wastewaters for Best Available Control Technology (BACT) and Lowest Achievable Emission Rate (LAER) determinations. Technical guidance projects focus on topics of national or regional interest that are identified through contact with State and Local agencies. The document addresses new and modified major sources, as defined in Parts C and D of the Clean Air Act (CAA). Steam stripping to remove the organic compounds in certain wastewater streams at the point of generation (prior to contacting the atmosphere) is the recommended control strategy. The document presents a description of the sources of organic containing wastewater, VOC emission estimation procedures for treatment and collection system units, and available VOC emission control strategies.

CL-VOC	VOLATILE ORGANIC COMPOUNDS
CT	CNTRL TECHNOLOGY DOC
EF	EMISSION FACTOR
EPA	ENVIRONMENTAL PROTECTION AGENCY
SA	SOURCE ASSESSMENT
28	CHEMICALS AND ALLIED PRODUCTS

**PB90-195736**

EIS (Environmental Impact Statement) NESHAPS (National Emission Standards for Hazardous Air Pollutants) for Radionuclides  
EPA, Washington, DC, ORP  
Sep 89, 1732p in 4 volumes, PC E99/MF E99

**Abstract:** The EPA is promulgating NESHAPS for radionuclides. An EIS has been prepared in support of the rulemaking. The EIS consists of the following 3 volumes: Vol. 1 - Risk Assessment Methodology (PB90-195744, EPA-520/1-89-005, PC A12/MF A02). The document contains chapters on hazard identification, movement of radionuclides through environmental pathways, radiation dosimetry, estimating the risk of health effects resulting from exposure to low levels of ionizing radiation, and a summary of the uncertainties in calculations of dose and risks. Vol. 2 - Risk Assessments (PB90-195751, EPA-520/1-89-006-1, PC A24/MF A03, and Appendixes to Vol. 2, PB90-195769, EPA-520/1-89-006-2, PC A16/MF A02). The document contains a chapter on each radionuclide source category studied. The chapters include an introduction, category description, process description, control technology, health impact assessment, supplemental control technology, and cost. It has an appendix which contains the inputs to all the computer runs used to generate the risk assessment. Vol. 3 - Economic Assessment (PB90-195777, EPA-520/1-89-007, PC A23/MF A03). Each Chapter, on a radionuclide source category studied, includes an introduction, industry profile, summary of emissions, risk levels, the benefits and costs of emission controls, and economic impact evaluations.

CL-RAD	RADIATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
NESHAP	NATL EMIS STD HAZ AP
10	METAL MINING
109	MISCELLANEOUS METAL ORES
1094	URANIUM-RADIUM-VANADIUM ORES
14	NONMETALLIC MINERALS, EXCEPT FUELS
147	CHEMICAL AND FERTILIZER MINERALS
1475	PHOSPHATE ROCK
28	CHEMICALS AND ALLIED PRODUCTS
281	INDUSTRIAL INORGANIC CHEMICALS
2819	INDUSTRIAL INORGANIC CHEMICALS, NEC
286	INDUSTRIAL ORGANIC CHEMICALS
2869	INDUSTRIAL ORGANIC CHEMICALS, NEC
287	AGRICULTURAL CHEMICALS
2874	PHOSPHATIC FERTILIZERS
49	ELECTRIC, GAS, AND SANITARY SERVICES
493	COMBINATION UTILITY SERVICES
4931	ELECTRIC AND OTHER SERVICES COMBINED
495	SANITARY SERVICES
4953	REFUSE SYSTEMS
51	WHOLESALE TRADE-NONDURABLE GOODS
519	MISC. NONDURABLE GOODS
5191	FARM SUPPLIES

**PB90-200288**

Compendium of Methods for the Determination of Air Pollutants in Indoor Air

EPA, Research Triangle Park, NC, AREAL  
Engineering Science

W.T. Winberry, et al.

Apr 90, 845p, EPA-600/4-90-010, PC A99/MF E06

Abstract: Determination of pollutants in indoor air is a complex task because of the wide variety of compounds of interest and the lack of standardized sampling and analysis procedures. To assist agencies and persons responsible for sampling and analysis of indoor pollutants, the methods compendium provides current, technically-reviewed sampling and analysis procedures in a standardized format for determination of selected pollutants of primary importance in indoor air. Each chapter contains one or more active or passive sampling procedures along with one or more appropriate analytical procedures. The ten chapters of the compendium cover determination of volatile organic compounds, nicotine, carbon monoxide and carbon dioxide, air exchange rate, nitrogen dioxide, formaldehyde, benzo(a)pyrene and other polynuclear aromatic hydrocarbons, acid gases and aerosols, particulate matter, and pesticides. As further advancements are made, the procedures may be modified or updated, or additional methods may be added as appropriate.

CL-ACID	ACIDIC COMPOUNDS INCLUDING ACID GASES
CL-PAH	POLYCYCLIC AROMATIC HYDROCARBONS
CL-PEST	PESTICIDES
CL-PM	PARTICULATE MATTER
CL-VOC	VOLATILE ORGANIC COMPOUNDS
EPA	ENVIRONMENTAL PROTECTION AGENCY
IA	INDOOR AIR
SA	SOURCE ASSESSMENT
10102-44-0	NITROGEN DIOXIDE
124-38-9	CARBON DIOXIDE
50-00-0	FORMALDEHYDE
50-32-8	BENZO(A) PYRENE
54-11-5	L-NICOTINE
630-08-0	CARBON MONOXIDE

**PB90-213893**

DEGADIS (DENSE GAS DISPERSION) Model, Version 2.1. User's Guide  
EPA, Research Triangle Park, NC, OAQPS

PEI Associates, Inc.

T.O. Spicer and J.A. Havens

Nov 89, 427p, EPA-450/4-89-019, PC A19/MF A03

Abstract: An improved Jet-Plume model has been interfaced with DEGADIS to provide for prediction of the trajectory and dilution of elevated dense gas jets to ground contact. DEGADIS predicts the ensuing ground-level plume dispersion. The Jet-Plume model provides for: automatic adjustment of integration step-size (using the Runge-Kutta-Gill method as in DEGADIS); elliptical plume shape (cross-section), with air entrainment specified consistent with the Pasquill-Gifford plume dispersion coefficient representation of atmospheric turbulent entrainment; user specification of averaging time; ground reflection when the plume (lower) boundary reaches ground level; and application to scenarios where the plume remains aloft.

DM

DISPERSION MODELING

EPA

ENVIRONMENTAL PROTECTION AGENCY

**PB90-215419**

National Radon Contractor Proficiency (RCP) Program. Proficiency Report

EPA, Washington, DC, ORP

ICF, Inc.

Jul 90, 181p, EPA-520/1-90-017, PC A09/MF A01

Abstract: The report will assist State, EPA Regions, and local government officials in providing advice to the public on the selection of proficient radon mitigation contractors. The Proficiency Report is a listing of 895 contractors who have met the requirements of EPA's National Radon Contractor Proficiency (RCP) Program as of May 19, 1990. Each contractor is listed by name, RCP identification number, company name, address, phone number, and geographic service area.

EPA

ENVIRONMENTAL PROTECTION AGENCY

IA

INDOOR AIR

10043-92-2

RADON

17

SPECIAL TRADE CONTRACTORS

179

MISC. SPECIAL TRADE CONTRACTORS

1799

SPECIAL TRADE CONTRACTORS, NEC

**PB90-216532**

Assessment of VOC Emissions from Fiberglass Boat Manufacturing  
EPA, Research Triangle Park, NC, AEERL  
Radian Corporation  
M.B. Stockton and I.R. Kuo  
May 90, 101p, EPA-600/2-90-019, PC A06/MF A01

Abstract: The report presents an assessment of volatile organic compound (VOC) emissions from fiberglass boat manufacturing. A description of the industry structure is presented, including estimates of the number of facilities, their size, and geographic distribution. The fiberglass boat manufacturing process is described, along with sources and types of VOC emissions. Model plants representative of typical facilities are also described. Estimates of VOC emissions presented on per plant and national bases. VOC emissions from this industry consist mainly of styrene emission from gel coating and lamination, and acetone or other solvent emissions from clean-up activities. Finally, potential VOC control technologies are evaluated for this industry, including a discussion of technical feasibility. Limited cost data are also presented.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
SA SOURCE ASSESSMENT  
100-42-5 STYRENE  
37 TRANSPORTATION EQUIPMENT  
373 SHIP AND BOAT BUILDING AND REPAIRING  
3732 BOAT BUILDING AND REPAIRING  
67-64-1 ACETONE

**PB90-216797**

Hospital Waste Incinerator Field Inspection and Source Evaluation Manual  
EPA, Washington, DC, SSCD  
Midwest Research Inst.  
S. Smith, et al.  
Feb 89, 223p, EPA-340/1-89-001, PC A10/MF A02

Abstract: The manual summarizes the information necessary for conducting field inspections of hospital waste incinerators. The manual is intended for use by Federal, State, and local field inspectors. The document presents the following information: (a) basic inspection procedures, (b) descriptions of the types of hospital waste incinerators, (c) descriptions of air pollution control systems which might be used on hospital incinerators, and (d) inspection techniques for hospital incinerators. Inspection checklists also are provided.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
RDG REG DEVELOPMENT GUIDE  
SA SOURCE ASSESSMENT  
49 ELECTRIC, GAS, AND SANITARY SERVICES  
495 SANITARY SERVICES  
4953 REFUSE SYSTEMS  
80 HEALTH SERVICES  
806 HOSPITALS

**PB90-217084**

Guide for Determining Compliance with the Clean Air Act Standards for Radionuclide Emissions from NRC-Licensed and Non-DOE Federal Facilities. (Revision 1)  
EPA, Washington, DC, ORP  
Oct 90, 70p, EPA-520/1-89-002, PC A04/MF A01

Abstract: The report provides guidance for determining compliance with one of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) covering facilities not operated by the DOE, that could emit Radionuclides to the Air. (40 CFR 61, Subpart 1).

CL-RAD RADIATION  
EPA ENVIRONMENTAL PROTECTION AGENCY  
RDG REG DEVELOPMENT GUIDE

**PB90-218611**

Portable Instruments User's Manual for Monitoring VOC Sources  
EPA, Research Triangle Park, NC, OAQPS  
PEI Associates, Inc.  
J. Busik and M. Cunningham  
Jun 86, 144p, EPA-340/1-86-015, PC A07/MF A01

Abstract: The U.S. Environmental Protection Agency (EPA) has promulgated New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP's) for several categories of sources that emit volatile organic compounds (VOC's) and that require monitoring with portable detection instruments. The manual presents information on the principles of operation of currently available portable monitors and the field inspection techniques for the monitor's safe use in both screening and compliance determinations. The manual is intended to be used by State and local agencies. The level of the inspection performed is often determined by the compliance history of the source and the regulatory requirements. The EPA has published Reference Method 21 to provide a technical method to test for leaks from these sources. Method 21 allows the user to select one of several instruments available on the market if they meet the specifications and performance requirements, discussed in Section 2. A summary of the published specifications of many of the portable VOC monitors is presented in the manual.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
RDG REG DEVELOPMENT GUIDE  
SS SOURCE SAMPLING

PB90-222704

Testing of Indoor Radon Reduction Techniques in Central Ohio Houses:  
Phase 2 (Winter 1988-1989)

EPA, Research Triangle Park, NC, AERL  
Acres International Corp.

W.O. Findlay, A. Robertson, and A.G. Scott

May 90, 299p, EPA-600/8-90-050, PC A13/MF A02

**Abstract:** The report gives results of tests of developmental indoor radon reduction techniques in nine slab-on-grade and four crawl-space houses near Dayton, Ohio. The slab-on-grade tests indicated that, when there is a good layer of aggregate under the slab, the sub-slab ventilation (SSV) mitigation technique, with only one or two suction pipes, can generally reduce indoor concentrations below 2 pCi/L (86 to 99% reduction). These reductions can be achieved even when: there are forced-air supply ducts under the slab; the slab is large (up to 2600 sq ft); and the foundation walls are hollow block. Operating the SSV system in suction always gave greater reductions than did operating in pressure. The crawl-space tests demonstrated that depressurizing under a plastic liner over the crawl-space floor was able to reduce living-area radon concentrations below 2 pCi/L (81 to 96% reduction). The performance of such sub-liner depressurization gave better reductions than did crawl-space ventilation (blowing air into, or out of, the crawl space). Completely covering the crawl-space floor with plastic sheeting was not always necessary to get adequate performance.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON

PB90-226614

Locating and Estimating Air Toxics Emissions from Sewage Sludge Incinerators

EPA, Research Triangle Park, NC, OAQPS  
Radian Corporation

L. Lamb, C.B. Brickley, and R. Dykes

May 90, 83p, EPA-450/2-90-009, PC A05/MF A01

**Abstract:** The document is intended to assist groups interested in inventorying air emissions of various potentially toxic substances from sewage sludge incinerators. Its intended audience includes Federal, State and local air pollution personnel. The document presents information on the process description of the various types of sewage sludge incinerators and their air pollution control equipment. Emission factors are presented for each major type of sewage sludge incinerators for the following: metals including arsenics, beryllium, cadmium, chromium, and nickel; and organics including chlorinated dibenzo-p-dioxins, dibenzofurans, benzene, chlorinated benzenes and phenol.

CL-METAL	METALLIC COMPOUNDS
CL-VOC	VOLATILE ORGANIC COMPOUNDS
CT	CNTRL TECHNOLOGY DOC
EF	EMISSION FACTOR
EPA	ENVIRONMENTAL PROTECTION AGENCY
108-95-2	PHENOL
132-64-9	DIBENZOFURAN
262-12-4	DIBENZO-P-DIOXIN
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4952	SEWERAGE SYSTEMS
4953	REFUSE SYSTEMS
71-43-2	BENZENE
7440-02-0	NICKEL
7440-38-2	ARSENIC AND COMPOUNDS AS AS
7440-41-7	BERYLLIUM
7440-43-9	CADMIUM
7440-47-3	CHROMIUM

**PB90-228610**

Available Models for Estimating Emissions Resulting from Bioremediation Processes: A Review  
EPA, Athens, GA, ERL  
AQUA TERRA Consultants  
S. Sharp-Hansen  
Mar 90, 275p, EPA-600/3-90-031, PC A12/MF A02

**Abstract:** The use of bioremediation processes to treat hazardous waste has increased in the last 10 years. Biological treatment offers the advantage of contaminant destruction rather than transfer to other media. There is concern, however, that significant amounts of organic pollutants are emitted to the air from biological treatment activities before they can be degraded. To estimate the magnitude of emissions from these facilities, overall fate models that incorporate the effects of several competing removal mechanisms are needed. The report focuses on the state-of-the-art in modeling air emissions from bioremediation processes. The biological treatment systems are described, as are the important pathways that affect the fate of organic pollutants in those systems. Currently available models are identified, described, and evaluated for each bioremediation process. Finally, some limitations of the models and the need for additional research are discussed.

CL-ORGANIC	ORGANIC COMPOUNDS
EF	EMISSION FACTOR
EPA	ENVIRONMENTAL PROTECTION AGENCY
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS

**PB90-228826**

Municipal Waste Combustion Multipollutant Study, Emission Test Report. Maine Energy Recovery Company Refuse Derived Fuel Facility, Biddeford  
EPA, Research Triangle Park, NC AEERL  
Midwest Research Inst.  
G. Schell, et al.  
Jul 89, 1358p in 3 volumes, EPA-600/8-89-064A-C, PC E99/MF E99

**Abstract:** Volume 1 - Summary of Results (PB90-228834, PC A08/MF A01). The report gives results of an emission test for a new municipal solid waste combustor in Biddeford, ME that burns refuse-derived fuel and is equipped with a lime spray dryer fabric filter (SD/FF) emission control system. Control efficiency of the SD/FF emission control system was measured for polychlorinated dibenzodioxins, polychlorinated dibenzofurans, particulate matter (PM), cadmium, chromium, arsenic, lead, mercury, sulfur dioxide, and hydrogen chloride. Additional continuous monitoring was conducted for oxygen, carbon dioxide, carbon monoxide, nitrogen oxides, and total hydrocarbons. Volume 2 (PB90-228842, PC A25/MF A04) contains the data collected by methods described in Vol. 1, including analyses, tables, graphs, and results. Volume 3 (PB90-228859, PC A99/MF A04) is a continuation of Vol. 2, and contains results, numerical analysis, tables, and graphs.

CL-DIOXIN	DIOXINS
CL-FURAN	FURANS
CL-HCARB	HYDROCARBONS
CL-LEAD	LEAD COMPOUNDS
CL-PM	PARTICULATE MATTER
CT	CNTRL TECHNOLOGY DOC
EPA	ENVIRONMENTAL PROTECTION AGENCY
SS	SOURCE SAMPLING
11104-93-1	NITROGEN OXIDES
124-38-9	CARBON DIOXIDE
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS
630-08-0	CARBON MONOXIDE
7439-97-6	MERCURY
7440-38-2	ARSENIC AND COMPOUNDS AS AS
7440-43-9	CADMIUM
7440-47-3	CHROMIUM
7446-09-5	SULFUR DIOXIDE
7647-01-0	HYDROGEN CHLORIDE

PB90-237116

Risk Assessment, Management, Communication: A Guide to Selected Sources. Volume 3, Number 1  
EPA, Washington, DC, OTRM  
Mar 89, 125p, EPA-IMSD-89-004A, PC A06/MF A01

Abstract: This is the seventh update to the March 1987 publication entitled Risk Assessment, Management, Communication: A Guide to Selected Sources. This series of risk management bibliographies is divided into three major sections: assessment, management, communication. Included in the issue are citations published between September 1988 and March 1989. The original guide was followed by three quarterly updates. These earlier updates constitute Volume One of the current semiannual series.

EPA ENVIRONMENTAL PROTECTION AGENCY  
RA RISK ASSESSMENT  
RC RISK COMMUNICATION

PB90-242314

Emission Factors for Iron and Steel Sources: Criteria and Toxic Pollutants  
EPA, Research Triangle Park, NC, AEERL  
Pechan (E.H.) and Associates, Inc.  
W.R. Barnard  
Jun 90, 173p, EPA-600/2-90-024, PC A08/MF A01

Abstract: The report provides a comprehensive set of emission factors for sources of both criteria and toxic air pollutants in integrated iron and steel plants and specialty electric arc shops (mini-mills). Emission factors are identified for process sources, and process and open source fugitive emissions. The emission factors are not specific to any one facility. Emission factors for gray iron foundries and the ferro-alloy industry are not included.

CI-HAPS TITLE III HAZARDOUS AIR POLLUTANTS  
EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY  
33 PRIMARY METAL INDUSTRIES  
331 BLAST FURNACE AND BASIC STEEL PRODUCTS  
3312 BLAST FURNACES AND STEEL MILLS  
332 IRON AND STEEL FOUNDRIES

PB90-244393

Testing of Indoor Radon Reduction Techniques in 19 Maryland Houses  
EPA, Research Triangle Park, NC, AEERL  
CDM Federal Programs Corp.  
D.G. Gilroy and W.M. Kaschak  
Jun 90, 289p, EPA-600/8-90-056, PC A13/MF A02

Abstract: The report gives results of testing of indoor radon reduction techniques in 19 houses in Maryland. The focus was on passive measures: various passive soil depressurization methods, where natural wind and temperature effects are utilized to develop suction in the system; and sealing of radon entry routes into the house. Active (fan-assisted) soil depressurization techniques were also tested. Passive soil depressurization systems typically gave moderate radon reductions (30-70%), although the reductions ranged from zero to 90%. Only two houses were reduced <4 pCi/L with the passive systems. A passive system is most likely to be successful when sub-slab communication is very good, when the house has a basement with no adjoining slab-on-grade or crawl-space wings, and when the foundation walls are poured concrete instead of hollow block. Entry route sealing as a stand-alone radon mitigation measure gave zero-50% reduction in the only house where it was tested. Active soil depressurization, tested in 18 houses, reduced 16 of them <4 pCi/L, and 12 of them <2 pCi/L; reductions were often >90%. Poor sub-slab communication prevented this approach from being fully successful in the other two houses; later modifications to these two systems reduced these houses <4 pCi/L also.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON

PB90-247453

Evaluation of Strategies for Promoting Effective Radon Mitigation. Risk Communication and Economic Research Series  
EPA, Washington, DC, OPPE  
Colorado University at Boulder  
J.K. Doyle, et al.  
Mar 90, 193p, EPA-230/02-90-075, PC A09/MF A02

Abstract: The Environmental Protection Agency has estimated that as many as 20,000 lung cancer deaths per year in the United States can be attributed to exposure to radon gas. The report evaluates alternative strategies for motivating people to test for radon gas in their homes and to mitigate if necessary. Specifically, two separate radon information and awareness programs were evaluated, one targeted to the general population in the Washington, D.C. area and the other to home buyers in the Boulder, Colorado area. The results suggest that a home buyer program is likely to be far more effective in terms of effective remediation to reduce home radon levels than a program aimed at the general population. The report discusses the empirical findings and develops a recommendation for increasing the effectiveness of radon awareness and mitigation programs.

EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
RC RISK COMMUNICATION  
10043-92-2 RADON

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**PB90-247487**

Distillation Operations in Synthetic Organic Chemical Manufacturing Industry. Background information for Promulgated Standards  
EPA, Research Triangle Park, NC, OAQPS  
Jun 90, 136p, EPA-450/3-83-005B, PC A07/MF A01

**Abstract:** Standards of performance for the control of volatile organic compound (VOC) emissions from distillation unit operations in the synthetic organic chemical manufacturing industry are being promulgated under Section 111 of the Clean Air Act. These standards will apply to VOC emissions from newly constructed, modified, and reconstructed distillation units. The document summarizes the responses to public comments received on the proposed standards and the basis for changes made since proposal.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
NSPS NEW SRC PERFORMANCE STD  
28 CHEMICALS AND ALLIED PRODUCTS

**PB90-247495**

Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry: Background Information for Promulgated Standards  
EPA, Research Triangle Park, NC, OAQPS  
Jun 90, 80p, EPA-450/3-82-001B, PC A05/MF A01

**Abstract:** Standards of performance for the control of volatile organic compound (VOC) emissions from air oxidation processes in the synthetic organic chemical manufacturing industry are being promulgated under Section 111 of the Clean Air Act. These standards will apply to VOC emissions from newly constructed, modified, and reconstructed air oxidation processes. The document summarizes the responses to public comments received on the proposed standards and the basis for changes made since proposal.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
NSPS NEW SRC PERFORMANCE STD  
28 CHEMICALS AND ALLIED PRODUCTS

**PB90-250135**

Measurements of Exhaled Breath Using a New Portable Sampling Method  
EPA, Research Triangle Park, NC, AREAL  
Research Triangle Inst.  
E.D. Pellizzari, et al.  
Jul 90, 313p, EPA-600/3-90-049, PC A14/MF A02

**Abstract:** Breath measurements offer the potential for a direct and noninvasive evaluation of human exposure to volatile organic compounds (VOCs) in the environments in which people live and work. The research study was conducted to further develop the potential of this exposure assessment methodology. A new alveolar breath measurement technique was developed and tested. Air samples were collected in 32 microenvironments and above 6 consumer products to determine a few potential sources of human exposures to selected VOCs. Elimination half-lives were estimated using a mono- and biexponential model. The alveolar breath collection and analysis methodology proved to be very useful for collecting many samples in short time intervals and this capability was very important for accurately describing the initial phase of the decay curves. Analysis of microenvironment air samples from homes, businesses, workplaces, vehicles, etc., revealed a wide range of potential sources of human exposures to VOCs at concentrations from 1 to 16,000 microg/cu m.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EA EXPOSURE ASSESSMENT  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-252495**

Reactor Processes in Synthetic Organic Chemical Manufacturing Industry. Background Information for Proposed Standards  
EPA, Research Triangle Park, NC, OAQPS  
Jun 90, 391p, EPA-450/3-90-016A, PC A17/MF A03

**Abstract:** Standards of performance for the control of volatile organic compound (VOC) emissions from new, modified, and reconstructed reactor process units used in the manufacture of synthetic organic chemicals are being proposed under Section 111 of the Clean Air Act. The document contains background information on the industry and processes concerned and environmental and economic impact assessments of the regulatory alternatives considered in developing the proposed standards.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
NSPS NEW SRC PERFORMANCE STD  
28 CHEMICALS AND ALLIED PRODUCTS

**PB90-254988**

Evaluation of Emission Factors for Formaldehyde from Certain Wood Processing Operations. Final Report, May-August 1989  
EPA, Research Triangle Park, NC, AERL  
Radian Corporation  
T.S. White  
Jun 90, 33p, EPA-600/8-90-052, PC A03/MF A01

**Abstract:** The report gives results of a search for information on formaldehyde emissions from wood veneer operations, to develop emission factors for the industry. Formaldehyde releases of 246 kg were reported under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 from a large plywood plant in Mississippi. However, existing data found during the study period were insufficient to allow reliable emission factors to be calculated.

EF	EMISSION FACTOR
EPA	ENVIRONMENTAL PROTECTION AGENCY
24	LUMBER AND WOOD PRODUCTS
243	MILLWORK, PLYWOOD & STRUCTURAL MEMBERS
2435	HARDWOOD VENEER AND PLYWOOD
2436	SOFTWOOD VENEER AND PLYWOOD
50-00-0	FORMALDEHYDE

**PB90-255662**

Air/Superfund National Technical Guidance Study Series. Development of Example Procedures for Evaluating the Air Impacts of Soil Excavation Associated with Superfund Remedial Actions  
EPA, Research Triangle Park, NC, OAQPS  
PEI Associates, Inc.  
G.L. Saunders  
Jul 90, 80p, EPA-450/4-90-014, PC A05/MF A01

**Abstract:** The purpose of the project was to identify and define the computation requirements for estimating the air impacts from the remediation of Superfund sites. Two example sites employing soil excavation were selected because they represent a complex emission source. The procedures for the evaluation of the ambient impacts were divided into several subtasks. These included site characterization, selection of remedial alternatives, definition of remedial activities, estimation of emission rates for each remedial activity, determination of ambient concentrations from dispersion modeling, and evaluation of carcinogenic and noncarcinogenic risks based on dispersion modeling results. The calculation of emission rates were used to estimate ambient impacts through dispersion models. The purpose was to outline a set of procedures that could be used, with existing tools, to assist in the evaluation of air-pathway effects.

CL-HAZWAST	HAZARDOUS WASTES
DM	DISPERSION MODELING
EPA	ENVIRONMENTAL PROTECTION AGENCY
RA	RISK ASSESSMENT
RDG	REG DEVELOPMENT GUIDE
SA	SOURCE ASSESSMENT

**PB90-256405**

Guides to Pollution Prevention: The Paint Manufacturing Industry  
EPA, Cincinnati, OH, RREL  
Jacobs Engineering Group, Inc.  
Jun 90, 74p, EPA-625/7-90-005, PC A04/MF A01

**Abstract:** Paint manufacturing facilities generate large quantities of both hazardous and nonhazardous wastes. These wastes are: equipment cleaning wastewater and waste solvent, filter cartridges, off-spec paint, spills, leftover containers; and pigment dusts from air pollution control equipment. Reducing the generation of these wastes at the source, or recycling the wastes on- or off-site, will benefit paint manufacturers by reducing raw material needs, reducing disposal costs; and lowering the liabilities associated with hazardous waste disposal. The guide provides an overview of the paint manufacturing processes and operations that generate waste and presents options for minimizing the waste generation through source reduction or recycling.

CL-HAZWAST	HAZARDOUS WASTES
CL-SOLVENT	SOLVENTS
EPA	ENVIRONMENTAL PROTECTION AGENCY
PP	POLLUTION PREVENTION
28	CHEMICALS AND ALLIED PRODUCTS
285	PAINTS AND ALLIED PRODUCTS
2851	PAINTS AND ALLIED PRODUCTS

**PB90-256413**

Guides to Pollution Prevention: The Printed Circuit Board Manufacturing Industry  
EPA, Cincinnati, OH, RREL  
Jacobs Engineering Group, Inc.  
Jun 90, 84p, EPA-625/7-90-007, PC A05/MF A01

**Abstract:** The guide identifies and analyzes waste minimization methodologies appropriate for the printed circuit board manufacturing industry. The wastes resulting from printed circuit board manufacturing are associated with five types of processes: cleaning and surface preparation; catalyst application and electroless plating; pattern printing and masking; electroplating; and etching. The wastes themselves include airborne particulates, spent acids and alkaline solutions, spent solvents, spent plating baths, waste rinsewater, and other wastes. The guide also presents a set of detailed waste minimization assessment worksheets suitable for use by shop managers and engineers, or by outside consultants, to formulate a waste minimization strategy for the particular plant. Finally, case histories of waste minimization assessments performed at three plants are given.

CL-ACID	ACIDIC COMPOUNDS INCLUDING ACID GASES
CL-ALKYLPB	ALKYL LEAD COMPOUNDS
CL-HAZWAST	HAZARDOUS WASTES
CL-METAL	METALLIC COMPOUNDS
CL-PM	PARTICULATE MATTER
CL-SOLVENT	SOLVENTS
EPA	ENVIRONMENTAL PROTECTION AGENCY
PP	POLLUTION PREVENTION
36	ELECTRONIC & OTHER ELECTRIC EQUIPMENT
367	ELECTRONIC COMPONENTS AND ACCESSORIES
3672	PRINTED CIRCUIT BOARDS

**PB90-256421**

Guides to Pollution Prevention: Selected Hospital Waste Streams  
EPA, Cincinnati, OH, RREL  
Jacobs Engineering Group, Inc.  
Jun 90, 52p, EPA-625/7-90-009, PC A04/MF A01

**Abstract:** The hazardous wastes generated by general medical and surgical hospitals are small in volume relative to those of industrial facilities; however, the wastes are of a wide variety. Some of the hazardous materials used by hospitals that become part of their waste streams include chemotherapy and antineoplastic chemicals, solvents, formaldehyde, photographic chemicals, radionuclides, mercury, waste anesthetic gases; and other toxic, corrosive and miscellaneous chemicals. Additional wastes such as infectious waste, incinerator exhaust, laundry-related waste, utility wastes, and trash were not addressed in the guide. Reducing the generation of these materials at the source, or recycling the wastes on- or off-site, will benefit hospitals by reducing disposal costs and lowering the liabilities associated with hazardous waste disposal. The guide provides an overview of hospital waste generating processes and presents options for minimizing waste generation through source reduction and recycling.

CL-CHEMOTH CHEMOTHERAPEUTICS  
CL-HAZWAST HAZARDOUS WASTES  
CL-PHARM PHARMACEUTICALS  
CL-RAD RADIATION  
CL-SOLVENT SOLVENTS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
PP POLLUTION PREVENTION  
50-00-0 FORMALDEHYDE  
7439-97-6 MERCURY  
80 HEALTH SERVICES  
806 HOSPITALS

**PB90-257767**

Engineering Design Criteria for Sub-Slab Depressurization Systems in Low-Permeability Soils  
EPA, Research Triangle Park, NC, AERL  
Southern Research Inst.  
C.S. Fowler, et al.  
Aug 90, 94p, EPA-600/8-90-063, PC A05/MF A01

**Abstract:** The report describes the development of engineering design criteria for the successful design, installation, and operation of sub-slab depressurization systems, based on radon (Rn) mitigation experience on 14 slab-on-grade houses in South Central Florida. The Florida houses are characterized as being hard to mitigate because of low sub-slab permeabilities. Premitigation indoor Rn concentrations ranged from 10 to 100 pCi/L. Mitigation experience and results have been combined into tables and graphs that can be used to determine recommended numbers and placement criteria for suction holes. Fan and exhaust pipe size selection is assisted by other tabulated and derived information. Guidance for installation of the sub-slab system to enhance the system's operation and effectiveness is also provided. This guidance is reported in the form of a design manual for use by mitigators when they are dealing with houses similar to these.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON

**PB90-257791**

Radon Mitigation Studies: Nashville Demonstration  
EPA, Research Triangle Park, NC, AERL  
Southern Research Inst.  
B.E. Pyle and A.D. Williamson  
Jul 90, 283p, EPA-600/8-90-061, PC A13/MF A02

**Abstract:** The report gives results of an EPA radon mitigation demonstration project involving 14 houses in the Nashville, TN, area with indoor radon levels of 5.6-47.6 pCi/L, using a variety of techniques, designed to be the most cost effective methods possible to implement, and yet adequately reduce radon levels to < 4 pCi/L. For crawl space houses, the techniques included sealing openings between living areas and crawl spaces and then passively venting the crawl spaces, depressurizing the crawl spaces, depressurizing under polyethylene sheeting in the crawl spaces, and depressurizing the crawl space soil itself. For basement and basement/crawl space combination houses, the techniques included sub-slab pressurization and depressurization, block wall depressurization, and combinations of these techniques with some of those listed above for exposed soil areas. Post-mitigation worst-case radon levels in these houses were generally from < 1 to about 5 pCi/L, with one house near 15 pCi/L. These houses are currently being followed with alphas track detectors to assess the long term exposure levels.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON

**PB90-259714**

**BACT/LAER Clearinghouse: A Compilation of Control Technology Determinations**

EPA, Research Triangle Park, NC, OAQPS

PEI Associates, Inc.

Jun 90, 1630p in 4 volumes, EPA-450/3-90-015A-D, PC E99/MF E99

**Abstract:** Volume 1 - Report Summary and Appendices A-G (PB90-259722, PC A10/MF A02); Volume 2 - Appendix H, Source Codes 1-3 (PB90-259730, PC A17/MF A02); Volume 3 - Appendix H, Source Codes 4-6 (PB90-259748, PC A23/MF A03); Volume 4 - Appendix H, Source Codes 7-12 (PB90-259755, PC A21/MF A03). The Clean Air Act as amended in 1977 prescribes several technology-based limitations affecting new or modified air pollution sources: (1) new source performance standards (NSPS); (2) best available control technology (BACT); and (3) lowest achievable emission rate (LAER). The basic purposes of the BACT/LAER Clearinghouse are to: (1) provide State and local air pollution control agencies with current information on case-by-case control technology determinations that are made nationwide and (2) promote communication, cooperation, and sharing of control technology information among the permitting agencies. The information presented in this compilation was abstracted from preconstruction permits and submitted voluntarily by the State and local air pollution control agencies. The Clearinghouse is intended as a reference for State and local air agencies in making BACT/LAER decisions. This report is the 5-year compilation containing all determinations inserted or updated since June 1985.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
RDG REG DEVELOPMNT GUIDE

**PB90-259862**

**Environmental Tobacco Smoke: A Guide to Workplace Smoking Policies.**

Public Review Draft

EPA, Washington, DC, OAR

Jun 90, 80p, EPA-400/6-90-004, PC A05/MF A01

**Abstract:** The publication is designed to help the non-expert understand the technical basis for smoking restrictions and to provide guidelines for implementing them. It explains the physical and chemical nature of Environmental Tobacco Smoke (ETS), how ETS exposure occurs, how it is measured, and the health effects of exposure. It examines passive smoking in the workplace and other sites, and examines legislative, legal, financial, educational and labor concerns. It includes different strategies for reducing exposure to smoking at the workplace along with the case studies of policies that have been successfully implemented. Finally it contains a list of resources for those interested in additional information.

CL-ETS ENVIRONMENTAL TOBACCO SMOKE  
CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR

**PB90-259870**

**Analysis of Air Toxics Emissions, Exposures, Cancer Risks and Controllability in Five Urban Areas. Volume 2. Controllability Analysis and Results**

EPA, Research Triangle Park, NC, OAQPS

J. Wilson, et al.

Apr 90, 107p, EPA-450/2-89-012B, PC A06/MF A01

**Abstract:** The report (Volume 2) is the second phase of a study to define the urban air toxics problem and to discern what combination of control measures can best be employed to mitigate the problem. Volume 1 of the study documented the base year analysis (nominally the year 1980), involving dispersion modeling of emissions data for 25 carcinogenic air toxics in five U.S. urban areas and a subsequent assessment of estimated aggregate cancer incidence. The Volume 2 report applies various control strategies and analyzes the resulting reduction in aggregate cancer incidence that would occur between 1980 and 1995. Control scenarios consisted (1) efforts that were currently underway to reduce air toxics emissions at the time of the study, (2) efforts that were expected to occur by 1995, mainly national standards that were under development, and (3) a series of selected more rigorous controls.

CL-ALDEHYD ALDEHYDES  
CL-CHC CHLORINATED HYDROCARBONS  
CL-PAH POLYCYCLIC AROMATIC HYDROCARBONS  
CL-VOC VOLATILE ORGANIC COMPOUNDS  
CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
RA RISK ASSESSMENT  
106-99-0 BUTADIENE,1,3-  
50-00-0 FORMALDEHYDE

FB90-259888

Idaho Radionuclide Study (Radionuclide Exposure Study, Pocatello and Soda Springs, Idaho)  
EPA, Las Vegas, NV, ORP  
Apr 90, 57p, EPA-520/6-90-008, PC A04/MF A01

Abstract: The report gives the results of a radionuclide exposure study conducted by EPA in southeastern Idaho to estimate the radiation dose resulting from the elemental phosphorus industry. The dispersion of radionuclides through the environs of Pocatello and Soda Springs, Idaho were investigated together with the relative importance of their sources and pathways affecting the populations of both towns and the magnitude of the attendant risks. Gamma ray exposures to the populations of Soda Springs and Pocatello, with the attendant risks, and the corresponding values for average and maximally exposed individuals in both communities are listed.

CL-RAD RADIATION  
EA EXPOSURE ASSESSMENT  
EPA ENVIRONMENTAL PROTECTION AGENCY  
13981-52-7 POLONIUM-210  
14 NONMETALLIC MINERALS, EXCEPT FUELS  
147 CHEMICAL AND FERTILIZER MINERALS  
1475 PHOSPHATE ROCK  
28 CHEMICALS AND ALLIED PRODUCTS  
281 INDUSTRIAL INORGANIC CHEMICALS  
2819 INDUSTRIAL INORGANIC CHEMICALS, NEC

FB90-261561

Development of Risk Assessment Methodology for Surface Disposal of Municipal Sludge  
EPA, Cincinnati, OH, ECAO  
Aug 90, 255p, EPA-600/6-90-001, PC A12/MF A02

Abstract: This is one of a series of reports that present methodologies for assessing the potential risks to humans or other organisms from the disposal or reuse of municipal sludge. The sludge management practices addressed by the series include land application practices, distribution and marketing programs, landfilling, surface disposal, incineration and ocean disposal. In particular, these reports provide methods for evaluating potential health and environmental risks from toxic chemicals that may be present in sludge. The document addresses risks from chemicals associated with surface disposal of municipal sludge. These proposed risk assessment procedures are designed as tools to assist in the development of regulations for sludge management practices. The procedures are structured to allow calculation of technical criteria for sludge disposal/reuse options based on the potential for adverse health or environmental impacts. The criteria may address management practices (such as site design or process control specifications), limits on sludge disposal rates or limits on toxic chemical concentrations in the sludge.

CL-SEWSLUD SEWAGE SLUDGE  
EPA ENVIRONMENTAL PROTECTION AGENCY  
RA RISK ASSESSMENT  
49 ELECTRIC, GAS, AND SANITARY SERVICES  
495 SANITARY SERVICES  
4952 SEWERAGE SYSTEMS

FB90-261652

Health Effects of Passive Smoking: Assessment of Lung Cancer In Adults and Respiratory Disorders in Children  
EPA, Washington, DC, OHRA  
K.G. Brown  
May 90, 280p, EPA-600/6-90-006A, PC A13/MF A02

Abstract: The draft document addresses the scientific, mostly epidemiologic, evidence on the potential association between passive smoking or Environmental Tobacco Smoke (ETS) and lung cancer in nonsmoking adults, and respiratory disorders in children. With respect to lung cancer in adults the draft report concludes that ETS is causally associated with lung cancer in nonsmoking adults and that according to EPA guidelines for carcinogen risk assessment, ETS is a Group A (known human) carcinogen; and that approximately 3800 lung cancer deaths per year among nonsmokers (never-smokers and former smokers) of both sexes in the United States are attributable to ETS. With respect to respiratory effects in children, ETS exposure from parental smoking, especially during infancy, is associated with increased prevalence of acute lower-respiratory tract infections (bronchitis and pneumonia), symptoms of irritation (cough, sputum, wheeze), and middle ear effusions (a sign of chronic middle ear disease). It also concludes that ETS is associated with reduced lung function and with a small reduction in the rate of pulmonary growth and development in children of mothers who smoke during their early childhood.

CL-ETS ENVIRONMENTAL TOBACCO SMOKE  
EPA ENVIRONMENTAL PROTECTION AGENCY  
HA HEALTH ASSESSMENT

**PB90-263013**

Characterization of Kerosene Heater Emissions Inside Two Mobile Homes  
EPA, Research Triangle Park, NC, AREAL

R.M. Burton, et al.

Mar 90, 10p, EPA-600/D-90-115, PC A02/MF A01

**Abstract:** In an effort to determine the impact of kerosene heater emissions on indoor air quality, measurements were made in and around two mobile homes at a rural mobile home park near Apex, NC. The sampling was performed at two single-wide mobile homes equipped with kerosene heaters. The concentrations of acidic aerosols and gases, fine and coarse particulate aerosol mass, carbon monoxide, nitrogen oxides, volatile organic compounds and semivolatiles, were determined for periods of heater operation and for periods in which heaters were not operated. Simultaneous outdoor measurements of acid aerosols and gases, fine and coarse aerosol mass, and volatile organic compounds were conducted to determine the contribution of outdoor pollutants to the indoor concentrations. Comparisons between the concentrations obtained from the analysis of outdoor, heater-on, and heater-off samples allowed the authors to examine the impacts of the kerosene emissions on indoor concentrations. Concentrations of sulfates, aerosol strong acidity, fine and coarse aerosol mass, carbon monoxide, and sulfur dioxide were found to be higher when the heater was operated; however, these heater-on concentrations were comparable to those observed in moderately polluted atmospheres.

CL-ACID	ACIDIC COMPOUNDS INCLUDING ACID GASES
CL-PM	PARTICULATE MATTER
CL-SVOC	SEMIVOLATILE ORGANIC COMPOUNDS
CL-VOC	VOLATILE ORGANIC COMPOUNDS
EPA	ENVIRONMENTAL PROTECTION AGENCY
IA	INDOOR AIR
630-08-0	CARBON MONOXIDE
7446-09-5	SULFUR DIOXIDE

**PB90-263179**

Unvented Kerosene Heater Emissions in Mobile Homes: Studies on Indoor Air Particles, Semivolatile Organics, Carbon Monoxide, and Mutagenicity

EPA, Research Triangle Park, NC, HERL

J.L. Mumford, et al.

1990, 10p, EPA-600/D-90-122, PC A02/MF A01

**Abstract:** The study was conducted to assess human exposure to air pollutants from kerosene heaters in mobile homes. An estimated 15-17 million unvented kerosene heaters have been sold in the U.S.; 33% of these to mobile home residents. The emissions can result in high pollutant levels in mobile homes that have a small air volume and low ventilation rate. Indoor air exchange rate, temperature, and humidity were measured. Chemical analyses, including polycyclic aromatic hydrocarbon (PAH) and nitro PAH, also were performed on the indoor air samples from a selected home with the kerosene heater on and off. Increases in CO and organic concentrations were found in most homes monitored. Analyses also suggested the presence of evaporated, unburned kerosene fuel, 56% of the sampling days (in all homes) showed mutagenic activity on the heater-off days. In comparison with the U.S. national ambient air standards, four out of the eight heaters investigated emitted pollutants that exceeded the ambient air standards some days. These data suggested that emissions from unvented kerosene heaters can significantly impact indoor air quality in mobile homes and that these emissions contain carcinogenic compounds.

CL-CARCIN	CARCINOGENS
CL-PAH	POLYCYCLIC AROMATIC HYDROCARBONS
CL-PM	PARTICULATE MATTER
CL-SVOC	SEMIVOLATILE ORGANIC COMPOUNDS
EPA	ENVIRONMENTAL PROTECTION AGENCY
IA	INDOOR AIR
630-08-0	CARBON MONOXIDE
8008-20-6	NAVY FUELS JP-5

**PB90-263989**

EPA's Pollution Prevention R and D Approaches and Insights into the Chemical Process Industry

EPA, Cincinnati, OH, RREL

P.M. Randall

Aug 90, 18p, EPA-600/D-90-142, PC A03/MF A01

**Abstract:** Chemical engineers face major research challenges associated with the imperative to protect and improve the environment. These challenges include designing optimal, less polluting chemical plants and processes, improving air quality through research, managing hazardous wastes responsibly, and developing multimedia approaches to reduce the chemical risk to human health and the environment. Since 1988, the U.S. EPA has established a pollution prevention R and D program to work with States, local governments, regional and Federal agencies, and industry to encourage the identification, development and demonstration of pollution prevention technologies and methods to reduce wastes.

CL-HAZWAST	HAZARDOUS WASTES
CL-SOLVENT	SOLVENTS
EPA	ENVIRONMENTAL PROTECTION AGENCY
PP	POLLUTION PREVENTION

**PB90-265349**

Interim Radon-Resistant Construction Guidelines for Use in Florida-1989

EPA, Research Triangle Park, NC, AEERL  
Florida Agricultural and Mechanical Univ.

T.D. Pugh

Aug 90, 29p, EPA-600/8-90-062, PC A03/MF A01

**Abstract:** The report gives results of a project to investigate, analyze, and develop radon-resistant construction guidelines that are consistent with other building codes and that could be applied to Florida. A literature search resulted in information on radon remediation techniques, new construction methods, and existing radon-resistant building codes such as those in Sweden and Canada. The identified techniques were amended, modified, or supplemented for incorporation into draft model guidelines for new construction in format consistent with the Southern Building Code Congress International, Inc.'s Standard Building Code. A technical review advisory committee formed during development of the guidelines, provided input and recommended changes to the draft guidelines. Although the project has resulted in guidelines for recommended construction practices, they should be coupled with a carefully planned and implemented program of experimentation. Eventually, this approach will lead to building code provisions that are scientifically defensible, cost effective, reliable, and easily incorporated into standard construction practice.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON  
15 GENERAL BUILDING CONTRACTORS  
152 RESIDENTIAL BUILDING CONSTRUCTION

**PB90-266743**

Emission Factors for Iron Foundries: Criteria and Toxic Pollutants

EPA, Research Triangle Park, NC, AEERL

Pechan (E.H.) and Associates, Inc.

G. Gschwandtner and S. Fairchild

Aug 90, 65p, EPA-600/2-90-044, PC A04/MF A01

**Abstract:** The report lists criteria and toxic pollutant emission factors for sources commonly found in gray and ductile iron foundries. Emission factors are identified for process source and process fugitive emissions. The emission factors, representing uncontrolled emissions, may be used to estimate emissions when site-specific information and data are not available.

CL-PM PARTICULATE MATTER  
EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY  
11104-93-1 NITROGEN OXIDES  
124-38-9 CARBON DIOXIDE  
33 PRIMARY METAL INDUSTRIES  
332 IRON AND STEEL FOUNDRIES  
3321 GRAY AND DUCTILE IRON FOUNDRIES  
7446-09-5 SULFUR DIOXIDE

**PB90-270554**

Symposium on Regulatory Approaches for Reducing VOC Emissions from the Use of Consumer Products, November 14-15, 1989. Proceedings

EPA, Research Triangle Park, NC, OAQPS

Jan 90, 128p, EPA-450/3-90-008, PC A07/MF A01

The report documents the proceedings of an EPA-sponsored industry-government symposium held in Research Triangle Park, North Carolina, on November 14-15, 1989. The document presents an overview of volatile organic carbons (VOC) regulatory programs, a status report on the Clean Air Act amendments, and discussions of possible EPA control strategies for consumer products, the use of market-based approaches to the reduction of VOC emissions from the use of consumer products, and EPA research in the area of consumer products. Presented are discussions of industry's view of regulating consumer products and descriptions of consumer product regulatory activities in New York, New Jersey, and California. Presentations dealing with product testing and the economic impacts associated with product reformulation are also included.

CL-CONSUMR CONSUMER PRODUCTS  
CL-SOLVENT SOLVENTS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
SA SOURCE ASSESSMENT

**PB90-270588**

Air/Superfund National Technical Guidance Study Series. Volume 2.

Estimation of Baseline Air Emissions at Superfund Sites (Revised)

EPA, Research Triangle Park, NC, OAQPS

Radian Corporation

B. Eklund and C. Schmidt

Aug 90, 390p, EPA-450/1-89-002A, PC A17/MF A03

**Abstract:** The report presents available methods for estimating air emissions at Superfund hazardous waste sites prior to any remedial action. The report revises and expands an earlier report, Procedures For Conducting Air Pathway Analyses For Superfund Activities, Volume II, Estimation Of Baseline Air Emissions At Superfund Sites, EPA-450/1-89-002. The purpose of the report is to assist EPA Air and Superfund staff, State Air Superfund program staff, Federal and State remedial and removal contractors, potentially responsible parties and others in designing, conducting, and reviewing air pathway analyses at undisturbed hazardous waste sites.

CL-HAZWAST HAZARDOUS WASTES  
EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY

**FB90-271902**

Summary Review of Health Effects Associated with Dimethylamine:  
Health Issue Assessment  
EPA, Research Triangle Park, NC, ECAO  
Dynamac Corp.  
C.E. Rothwell, et al.  
Sep 90, 74p, EPA-600/8-90-038F, PC A04/MF A01

**Abstract:** Chemical properties and toxicity studies for dimethylamine (DMA) are reviewed. At 25 C, DMA is a water-soluble, colorless, flammable gas, with both natural and anthropogenic sources. Body burden of DMA is due to rapid absorption of inhaled or ingested DMA, along with endogenous formation; urinary excretion of unmetabolized compound is primary route of elimination. Microsomal enzymes in nose and liver convert DMA to formaldehyde. DMA in the stomach in presence of nitrite and acid conditions can be converted to nitrosamines. Chronic inhalation studies in 2 or more species indicate concentration-dependent toxicity in nasal mucosa with no other tissues affected except small decrease in body weight at 175 ppm. There is no evidence for carcinogenicity, mutagenicity; there are no data on teratogenic or reproductive effects. Human data available are limited to secondary reports of eye irritation at low concentration, with nose, throat, and lung irritation at 100 ppm DMA. Skin or eye contact produces severe burns. Further data are needed on ambient levels and human effects.

EPA ENVIRONMENTAL PROTECTION AGENCY  
HA HEALTH ASSESSMENT  
124-40-3 DIMETHYLAMINE

**FB90-274077**

Identification of Candidate Houses for the North Florida Portion of the Florida Radon Mitigation Project  
EPA, Research Triangle Park, NC, AEERL  
Florida Univ., Gainesville  
G.S. Roessler, et al.  
Sep 90, 149p, EPA-600/8-90-070, PC A07/MF A01

**Abstract:** The report gives results of a study to locate candidate houses for a proposed radon mitigation research and demonstration project in North Florida. The effort involved: identification of target geographical areas, radon monitoring in identified clusters, and house characterization. Selection of target areas with a potential for elevated indoor radon started with a review of a statewide radiation study completed in 1987 and examination of the local geographic pattern observed in a 1986-87 pilot study of the Gainesville area. This effort indicated that North Florida target areas could be selected on the basis of the near-surface occurrence of the Hawthorn geological formation. Volunteer houses for radon monitoring in Alachua and Marion counties were obtained by announcing the study in newspaper articles. Screening measurements were made in about 400 target area houses according to EPA protocols using a vendor-supplied charcoal collector method. Results were similar in the two counties, and distributions were similar in both slab and crawl-space houses.

EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON

**FB90-274119**

Radon-Resistant Residential New Construction  
EPA, Research Triangle Park, NC, AEERL  
M.C. Osborne  
Jul 88, 84p, EPA-600/8-88-087, PC A05/MF A01

**Abstract:** The manual provides builders and potential new house buyers with a broader selection and explanation of techniques that are expected to be effective in reducing the potential for elevated radon levels in the house. In addition, legislators, regulators, and residential code writers may choose to evaluate these radon-resistant construction technologies for potential application to or modification of existing regulations or codes applicable to residential construction. Three approaches to resolving the radon problem in the construction of new houses are to: (1) prevent radon entry by using barrier methods, (2) reduce the radon entry driving forces, and (3) divert the radon from the house through sub-slab ventilation. Radon entry routes of concern in new construction are the same as those that have previously been identified for existing houses. Figures provided in the report depict the major radon entry routes for simple basement, slab-on-grade, and crawl-space houses. Expensive control measures may be justified if they serve multiple purposes, such as combining radon control with water control or eliminating the need for constantly operating a mechanical control system through a high initial cost.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON  
15 GENERAL BUILDING CONTRACTORS  
152 RESIDENTIAL BUILDING CONSTRUCTION

**FB90-274283**

Environmental Asbestos Assessment Manual. Superfund Method for the Determination of Asbestos in Ambient Air. Part 1. Method  
EPA, Washington, DC, OERR  
May 90, 121p, EPA-540/2-90-005A, PC A06/MF A01

**Abstract:** The report provides a sampling and analysis method for the determination of asbestos in the air to provide results suitable for supporting risk assessments at Superfund sites. Part 2 presents the technical background and considerations addressed during the development of the method.

EPA ENVIRONMENTAL PROTECTION AGENCY  
SS SOURCE SAMPLING  
1332-21-4 ASBESTOS



**PB90-274291**

Environmental Asbestos Assessment Manual. Superfund Method for the Determination of Asbestos in Ambient Air. Part 2. Technical Background

EPA, Washington, DC, OERR

May 90, 106p, EPA-540/2-90-005B, PC A06/MF A01

**Abstract:** The report provides a sampling and analysis method for the determination of asbestos in the air to provide results suitable for supporting risk assessments at Superfund sites. Part 1 presents the method to be used.

EPA ENVIRONMENTAL PROTECTION AGENCY  
SS SOURCE SAMPLING  
1332-21-4 ASBESTOS

**PB90-500257**

ISCST: Industrial Source Complex Short Term. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model (for Microcomputers)

EPA, Research Triangle Park, NC, ESRL

J. Mersch

Aug 89, 1 diskette, EPA-SW/DK-89-146, CP D03

**Abstract:** The software is contained on 5 1/4-inch diskettes, double density (360K), compatible with the IBM PC microcomputer. The diskettes are in the ASCII format. Price includes documentation, PB88-171475, PB88-171483, and PB88-171491. The Industrial Source Complex Short-Term model is a steady-state Gaussian plume model which can be used to assess pollutant concentrations from a wide variety of sources associated with an industrial source complex. The model can account for settling and dry deposition of particulates, downwash, area, line and volume sources, plume rise as a function of downward distance, separation of point sources, and limited terrain adjustment. Average concentration or total deposition may be calculated in 1-, 2-, 3-, 4-, 6-, 8-, 12- and/or 24-hour time periods. An 'N'-day average concentration (or total deposition) over the total number of hours may also be computed. Software Description: The model is written in the FORTRAN programming language for implementation on an IBM PC microcomputer. Data is in compressed format but a dearchive utility is included.

DM DISPERSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500265**

LONGZ and SHORTZ. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Models

EPA, Research Triangle Park, NC, ESRL

J. Mersch

Aug 89, 2 diskettes, EPA-SW/DK-89-164, CP D03

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. Price includes documentation, PB83-146092, PB83-146100, and PB86-244878. LONGZ is designed to calculate the long-term and SHORTZ is designed to calculate the short-term pollutant concentration produced at a large number of receptors by emissions from multiple stack, building, and area sources. LONGZ uses statistical wind summaries to calculate long-term (seasonal or annual) average concentrations. SHORTZ uses sequential short term (usually hourly) meteorological inputs to calculate concentrations for averaging times ranging from 1 hour to 1 year. The models are applicable in areas of both flat and complex terrain, including areas where terrain elevations exceed stack-top elevations. The programs require random-access mass storage capability. Software Description: The software is written in the FORTRAN programming language for implementation on an IBM model 3090 computer. The model is distributed on a 5 1/4-inch IBM/PC-compatible diskette. Data is in compressed format but a dearchive utility is included.

DM DISPERSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500315**

RAM. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

J. Mersch

Aug 89, 1 diskette, EPA-SW/DK-89-151, CP D01

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. Price includes documentation, PB88-113261. Gaussian-plume multiple-source air quality algorithm. RAM, a short-term Gaussian steady-state algorithm estimates concentrations of stable pollutants from urban point and area sources. Hourly meteorological data are used. Hourly concentrations and averages over a number of hours can be estimated. Briggs plume rise is used. Pasquill-Gifford dispersion equations with dispersion parameters thought to be valid for urban areas are used. Concentrations from area sources are determined using the method of Hanna, that is, sources directly upwind are considered representative of area source emissions affecting the receptor. Special features include determination of locations of uniformly spaced receptors to ensure good area coverage with a minimum number of receptors.

DM DISPERSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500323**

CRSTER: EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model  
EPA, Research Triangle Park, NC, ESRL  
J. Mersch  
Aug 89, 1 diskette, EPA-SW/DK-89-152, CP D01

Abstract: The model is contained on 5 1/4-inch, double density (360K) diskette, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. Price includes documentation, PB-271 360. The algorithm estimates ground-level concentrations resulting from up to 19 colocated elevated stack emissions for an entire year and prints out the highest and second highest 1-, 3-, and 24-hour concentrations as well as the annual mean concentrations at a set of 180 receptors (5 distances by 36 azimuths). The algorithm is based on a modified form of the steady-state Gaussian plume equation which uses either Pasquill-Gifford or Briggs urban dispersion coefficients and includes adjustments for plume rise and limited mixing. Terrain adjustments are made as long as the surrounding terrain is physically lower than the lowest stack height input. Pollutant concentrations for each averaging time are computed for discrete, non-overlapping time periods (no running averages are computed) using measured hourly values of wind speed and direction, and estimated hourly values of atmospheric stability and mixing height. Software Description: The model is written in the FORTRAN programming language for implementation on an IBM 3090 computer.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500331**

PTPLU. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model  
EPA, Research Triangle Park, NC, ESRL  
J. Mersch  
Aug 89, 1 diskette, EPA-SW/DK-89-153, CP D01

Abstract: The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. Price includes documentation, PB83-211235. PTPLU is a point source dispersion Gaussian screening model for estimating maximum surface concentrations for 1-hour concentrations. PTPLU is based upon Briggs' plume rise methods and can use either Pasquill-Gifford or Briggs' urban dispersion coefficients. PTPLU is an adaption and improvement of PTMAX which allows for wind profile exponents and other optional calculations such as buoyancy induced dispersion, stack downwash, and gradual plume rise. PTPLU produces an analysis of concentration as a function of wind speed and stability class for both wind speeds constant with height and wind speeds increasing with height. Using the extrapolated wind speeds and the options allows the model user a more accurate selection of distances to maximum concentration. PTPLU1 is the interactive version of the model. Software Description: The model is written in the FORTRAN programming language for implementation on an IBM 3090 computer. The software is distributed on a 5 1/4-inch IBM/PC-compatible diskette. Data is in compressed format but a dearchive utility is included.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500349**

VALLEY. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model  
EPA, Research Triangle Park, NC, ESRL  
J. Mersch  
Aug 89, 1 diskette, EPA-SW/DK-89-163, CP D01

Abstract: The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. Price includes documentation, PB-274054. The VALLEY algorithm is a steady-state, univariate Gaussian plume dispersion algorithm designed for estimating either 24-hour or annual concentrations resulting from emissions from up to 50 (total) point and area sources. Calculations of ground-level pollutant concentrations are made for each frequency designated in an array defined by six stabilities, 16 wind directions, and six wind speeds for 112 program-designed receptor sites on a radial grid of variable scale. Empirical dispersion coefficients are used and include adjustments for plume rise and limited mixing. Plume height is adjusted according to terrain elevations and stability classes. Software Description: The software is written in the FORTRAN programming language for implementation on an IBM model 3090 computer. The model is distributed on a 5 1/4-inch IBM/PC-compatible diskette. Data is in compressed format but a dearchive utility is included.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500372**

RTDM 3.2: Rough Terrain Diffusion Model. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model.  
EPA, Research Triangle Park, NC, ESRL  
J. Mersch  
Aug 89, 1 diskette, EPA-SW/DK-89-168, CP D01

Abstract: The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. Price includes documentation, PB88-171467. The rough terrain diffusion model (RTDM3.2) is a sequential Gaussian plume model designed to estimate ground-level concentrations in rough (or flat) terrain in the vicinity of one or more co-located point sources. It is designed for applications involving chemically stable atmospheric pollutants and is best suited for elevation of buoyant plume behavior within about 15 km from the source(s). RTDM has special algorithms to deal with plume behavior in complex terrain. Software Description: The software is written in the FORTRAN programming language for implementation on an IBM model 3090 computer. The model is distributed on a 5 1/4-inch IBM/PC-compatible diskette. Data is in compressed format but a dearchive utility is included.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500380**

ISCLT: Industrial Source Complex Long Term. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

J. Mersch

Aug 89, 1 diskette, EPA-SW/DK-89-172, CP D03

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. Price includes documentation PB88-171475, PB88-171483, and PB88-171491. The Industrial Source Complex Long Term model is a steady-state Gaussian plume model which can be used to assess pollutant concentrations from a wide variety of sources associated with an industrial source complex. The model can account for settling and dry deposition of particulates, downwash, area, line and volume sources, plume rise as a function of downwind distance, separation of point sources, and limited terrain adjustment. ISCLT is designed to calculate the average seasonal and/or annual ground level concentration or total deposition from multiple continuous point, volume and/or area sources. Provision is made for special discrete X, Y receptor points that may correspond to sampler sites, points of maxima, or special points of interest.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500398**

ISCST: Industrial Source Complex Short Term. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

J. Mersch

Aug 89, 1 diskette, EPA-SW/DK-89-173, CP D03

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. Price includes documentation, PB88-171475, PB88-171483, and PB88-171491. The Industrial Source Complex Short-Term model is a steady-state Gaussian plume model which can be used to assess pollutant concentrations from a wide variety of sources associated with an industrial source complex. The model can account for settling and dry deposition of particulates, downwash, area, line and volume sources, plume rise as a function of downwind distance, separation of point sources, and limited terrain adjustment.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500414**

COMPLEX1. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

J. Mersch

Aug 89, 1 diskette, EPA-SW/DK-89-176, CP D01

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM 3090 computer. ASCII format diskettes are available as PB90-500364. COMPLEX1 is a multiple point source code with terrain adjustment. The model specifications for testing were suggested by team 'B' on complex terrain at the Regional Workshop on Air Quality Modeling in Chicago, February 1980. It is a sequential model utilizing hourly meteorological input. It assumes a normal distribution in the vertical and a uniform distribution across a 22.5 degree sector. The initial screening technique for complex terrain applications, described in the Guideline on Air Quality Models (Revised), has been incorporated as an option in COMPLEX1. Software Description: The software is written in the FORTRAN programming language for implementation on an IBM model 3090 computer. The model is distributed on a 5 1/4-inch IBM/PC-compatible diskette. Data is in compressed format but a dearchive utility is included.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500752**

INPUFF. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

B. Petersen

Aug 89, 1 diskette, EPA-SW/DK-89-154, CP D01

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. Price includes documentation, PB86-242468 and PB86-242450. INPUFF is primarily designed to model a single event during which one meteorological transition period may occur, such as going from afternoon to evening conditions. Up to 144 separate meteorological periods of the same length may be used to characterize the meteorology during the event; this provides a time resolution that ranges from minutes to an hour. The user has the option of specifying the wind field for each meteorological period at up to 100 grid locations or allowing the model to default to a homogeneous wind field. Software Description: The model is written in the FORTRAN programming language for implementation on an IBM 3090 computer.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500760**

PEM: Pollution Episodic Model. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

B. Petersen

Aug 89, 1 diskette, EPA-SW/DK-89-155, CP D02

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. Price includes documentation, PB84-232537, PB84-164128, and PB84-138742. The Pollution Episodic Model (PEM) is an urban scale (up to 50km distances) air pollution model capable of predicting short-term (1 to 24-hour) average surface concentrations and deposition fluxes of two gaseous or particulate pollutants at up to a maximum of 2500 ground-level receptors located on a 50km by 50km square receptor grid. Predictions are based on steady-state Gaussian plume assumptions, Briggs' plume rise formulations, and Pasquill-Gifford (P-G) dispersion parameters. The surface concentration and deposition flux estimates of two independent non-reactive (gaseous or particulate) pollutants or one pollutant with first-order chemical decay can be obtained as special cases of the model. Up to 300 point sources and up to 50 area sources may be included in the model inputs. Software Description: The model is written in the FORTRAN programming language for implementation on an IBM 3090 computer.

CL-PM PARTICULATE MATTER  
DM DISPERSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500794**

MESOPUFF. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

B. Petersen

Aug 89, 1 diskette, EPA-SW/DK-89-158, CP D01

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. Price includes documentation, PB84-181775. The MESO model is Lagrangian variable-trajectory puff superposition model suitable for modeling the transport, diffusion, and removal of air pollutants from multiple point and area sources at transport distances beyond the range of conventional straight-line Gaussian plume models (i.e.; beyond 10-50). Software Description: The model is written in the FORTRAN programming language for implementation on an IBM 3090 computer.

DM DISPERSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500802**

PAL: Point, Area and Line Source Algorithm Model. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

B. Petersen

Aug 89, 1 diskette, EPA-SW/DK-89-159, CP D01

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. Price includes documentation, PB87-168787. The PAL is an acronym for the Point, Area and Line source algorithm. PAL is a method of estimating short-term dispersion using Gaussian-plume steady-state assumptions. The algorithm can be used for estimating concentrations of non-reactive pollutants at 99 receptors for averaging times of from 1 to 24 hours, and for a limited number of point, area, and line sources (99 of each type). Calculations are performed for each hour. Software Description: The model is written in the FORTRAN programming language for implementation on an IBM 3090 computer.

DM DISPERSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500810**

HIGHWAY-ROADWAY. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model

EPA, Research Triangle Park, NC, ESRL

B. Petersen

Aug 89, 1 diskette, EPA-SW/DK-89-160, CP D01

**Abstract:** The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. Price includes documentation, PB80-227556. ROADWAY is a finite-difference model which solves a conservation of species equation to predict pollutant concentrations within two hundred meters of a highway. It uses surface layer similarity theory to predict wind and eddy diffusion profiles from temperature at two heights and wind velocity upwind of the highway. A unique feature of the model is its use of vehicle wake theory. It is assumed that vehicle wakes affect the wind and turbulence fields in a linear manner with wake intensity a function of vehicle speed, downwind distance, and distance from the wake center. HIWAY is a model which computes the hourly concentrations of non-reactive pollutants downwind of roadways. It is applicable for uniform wind conditions and level terrain. Although best suited for at-grade highways, it can also be applied to depressed highways.

DM DISPERSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500828**

UTIL-1. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model  
EPA, Research Triangle Park, NC, ESRL  
B. Petersen  
Aug 89, 1 diskette, EPA-SW/DK-89-161, CP D01

Abstract: The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. Price includes documentation, PB84-229467 and PB83-107342. CALMPRO, Version 1.0, is a postprocessor for MPTEP, CRSTER, or ISC that reads data from an hourly concentration file (output from MPTEP, CRSTER, or ISC). RUNAVG, Version 1.0, is a postprocessor program for determining the highest and second-highest non-overlapping running average. RUNAVG accepts hourly concentration file input from either ISCST, TUPOS, RAM, MPTEP, or CRSTER. UTMCON, Version 1.0, is a utility program to convert from latitude and longitude to UTM coordinates and vice versa. CHAVG, Version 1.0, is a postprocessor program for computing running averages (averages that begin each hour and overlap) and end-to-end averages (averages that do not overlap) from hourly concentration disk or tape files.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500836**

MPTDS Version 1.0. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model  
EPA, Research Triangle Park, NC, ESRL  
B. Petersen  
Aug 89, 1 diskette, EPA-SW/DK-89-162, CP D01

Abstract: The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. Price includes documentation, PB82-215153 and PB83-114207. MPTDS is a modification of MPTEP to explicitly account for gravitational settling and/or deposition loss of a pollutant. Surface deposition fluxes can be printed under an optional output feature. MPTDS is a multiple point source code with an optional terrain adjustment feature. The code is primarily based upon MPTEP which has Gaussian modeling assumptions. Execution is limited to a maximum of 250 point sources and 180 receptors. Hourly meteorological data are required. Period of simulation can vary from 1 hour to 1 year. Software Statement: The software is written in the FORTRAN programming language for implementation on an IBM model 3090 computer. The model is distributed on a 5 1/4-inch, IBM/PC-compatible diskette.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500844**

PAL: Point, Area and Line Source Algorithm. EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model (for Microcomputers)  
EPA, Research Triangle Park, NC, ESRL  
B. Petersen  
Aug 89, 1 diskette, EPA-SW/DK-89-165, CP D01

Abstract: The software is contained on 5 1/4-inch diskettes, double density (360K), compatible with the IBM PC microcomputer. The diskettes are in the ASCII format. Price includes documentation, PB87-168787. PAL is a method of estimating short-term dispersion using Gaussian-plume steady-state assumptions. The algorithm can be used for estimating concentrations of non-reactive pollutants at 99 receptors for averaging times of from 1 to 24 hours and for a limited number of point, area, and line sources (99 of each type). Calculations are performed for each hour. The hourly meteorological data required are wind direction, wind speed, stability class, and mixing height. Single values of each of these four parameters are assumed representative for the area modeled. The PAL model can treat deposition of both gaseous and suspended particulate pollutants in the plume since gravitational settling and dry deposition of the particles are explicitly accounted for. Software Description: The software is written in the FORTRAN programming language for implementation on an IBM-PC microcomputer.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500869**

DATA: Sample Meteorological Data and Random Numbers Data File  
EPA, Research Triangle Park, NC, ESRL  
B. Petersen  
Aug 89, 1 diskette, EPA-DF/DK-89-170, CP D01

Abstract: The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. The file CINDAY in unformatted form has been used for sample meteorological input to a number of dispersion models, such as RAM, CRSTER, MPTEP, and ISC, for tests using a year's data. Since a file in unformatted or binary form cannot readily be transferred from computer to computer, the file is furnished in two parts (PT1 and PT2) in ASCII form. The program ASCBIN converts the ASCII meteorological data to unformatted (binary form). The two parts of the file should be combined together first.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-500877**

TUPOS: EPA/ORD (Environmental Protection Agency/Office of Research and Development) Air Quality Simulation Model  
EPA, Research Triangle Park, NC, ESRL  
B. Petersen  
Aug 89, 1 diskette, EPA-SW/DK-89-171, CP D02

Abstract: The model is contained on 5 1/4-inch, double density (360K) diskettes, compatible with the IBM PC microcomputer, ready for uploading to an IBM model 3090 computer. Price includes documentation, PB86-181310, PB86-181328, and PB86-241031. TUPOS estimates dispersion directly from fluctuation statistics at plume level and calculates plume rise and partial penetration of the plume into stable layers using vertical profiles of wind and temperature. TUPOS can be used for short-term (hours to days) impact assessment of inert pollutants from single or multiple sources and can be expected to have greatest accuracy for locations within 10 km of the source. Although TUPOS will make computations for receptors having any groundlevel elevation, it is not intended as a complex terrain model, but rather as a model for calculations over flat or gently rolling terrain. TUPOS will optionally treat buoyancy-induced dispersion but does not include building downwash, deposition, or fumigation.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-501115**

Surface Impoundment Modeling System (SIMS), Version 1.0 (for Microcomputers)  
EPA, Research Triangle Park, NC, OAQPS  
D.C. Misenheimer  
Sep 89, 1 diskette, EPA-SW/DK-90-009, CP D01

Abstract: The software is contained on 5 1/4-inch diskettes, double density (360K), compatible with the IBM PC microcomputer. The diskettes are in the ASCII format. Price includes documentation, PB90-141227 and PB90-141235. The Surface Impoundment Modeling System (SIMS) is a personal computer program designed to estimate air emissions from surface impoundments. The emission estimates are based on mass transfer models developed by the Emissions Standards Division of the Environmental Protection Agency during the evaluation of hazardous waste treatment, storage, and disposal facilities. SIMS allows the user to specify all the required inputs to these emission models when the information is available, or when only limited information is available, provides default values for most of the model inputs. Software Description: The software is written in the C programming language for implementation on an IBM PC or compatible.

EF EMISSION FACTOR  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-502253**

DEGADIS (Dense Gas DISpersion) Model, Version 2.1 (for Microcomputers)  
EPA, Research Triangle Park, NC, OAQPS  
D. Guinnup  
1989, 1 diskette, EPA-SW/DK-90-034, CP D01

Abstract: Supersedes PB88-202379. Computer: DEC VAX. Language: FORTRAN. The program is written in FORTRAN for compilation and execution on a DEC VAX computer. Implementation on any other system may be attempted at the risk of the user. To facilitate dissemination of the model, it is being provided on diskette. The software is contained on one 360K, 5 1/4-inch diskette, double density. File format: Executable code only. The diskettes are in the ASCII format. Price includes documentation, PB90-213893. An improved Jet-Plume model has been interfaced with DEGADIS to provide for prediction of the trajectory and dilution of elevated dense gas jets to ground contact. DEGADIS predicts the ensuing ground-level plume dispersion. The Jet-Plume model provides for: automatic adjustment of integration step-size (using the Runge-Kutta-Gill method as in DEGADIS); elliptical plume shape (cross-section), with the Pasquill-Gifford plume dispersion coefficient representation of atmospheric turbulent entrainment; user specification of averaging time; ground reflection when the plume (lower) boundary reaches ground level; and application to scenarios where the plume remains aloft. The model should be uploaded via modem from a PC terminal to host a VAX computer, and several files must then be renamed prior to compilation and execution.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB90-504119**

Complex Terrain Dispersion Model Plus (CTDMPLUS) (for Microcomputers)  
EPA, Research Triangle Park, NC, AREAL  
Jun 90, 1 diskette, EPA-SW/DK-90-164, CP D05

Abstract: System: IBM PC or compatible; MS DOS operating system. Language: FORTRAN77 and Pascal. Attempts to run the modeling system without a math co-processor will cause a runtime error number of 4001. Supersedes PB88-161682 and PB88-162169. The software is contained on one 1.2M, 5 1/4 inch diskette, high density. File format: ASCII. Price includes documentation, PB90-243809. The Complex Terrain Dispersion Model Plus (CTDMPLUS) is a refined air quality model for use in all stability conditions for complex terrain applications. It contains the technology of the original Complex Terrain Dispersion Model (CTDM) for stable and neutral conditions, but also models daytime, unstable conditions. The model makes use of considerable detail in the terrain and meteorological data (as compared to current EPA regulatory models) and requires the parameterization of individual terrain features, thus considering the three-dimensional nature of the interaction of the plume and terrain.

DM DISPERSSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB91-102111**

Control of VOC Emissions from Polystyrene Foam Manufacturing  
EPA, Research Triangle Park, NC, OAQPS  
Radian Corporation  
C.J. Bagley, J.S. McLean, and M.B. Stockton  
Sep 90, 112p, EPA-450/3-90-020, PC A06/MF A01

**Abstract:** The document contains information on polystyrene foam manufacturing processes, associated emissions of VOCs, emission control methods, and cost estimates for emission control.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
SA SOURCE ASSESSMENT  
100-42-5 STYRENE  
30 RUBBER AND MISC. PLASTICS PRODUCTS  
308 MISCELLANEOUS PLASTICS PRODUCTS, NEC  
3086 PLASTICS FOAM PRODUCTS

**PB91-103556**

Technical Support Document on Risk Assessment of Chemical Mixtures  
EPA, Cincinnati, OH, ECAO  
Syracuse Research Corporation  
Nov 88, 186p, EPA-600/8-90-064, PC A09/MF A01

**Abstract:** The document was recommended by the U.S. EPA's Science Advisory Board as a means of providing the broad technical background for the principles and procedures described in the 'Guidelines for Health Risk Assessment of Chemical Mixtures'. Unique sections include an overview of available toxicity data on complex mixtures and binary exposures, an estimate of the maximum synergistic effect observed for environmental chemicals, an evaluation of quantitative methods (statistics and models) that have been used in characterizing interaction data base, and recommendations for Guidelines revisions and future research relevant to risk assessment. The two most significant conclusions in the document are (1) that the available literature is extremely poor for use in quantifying the extent of synergism expected from environmental exposures, and (2) that validation of in vitro and short-term in vivo studies seems to be the most promising approach for assessment of complex mixtures.

EPA ENVIRONMENTAL PROTECTION AGENCY  
RA RISK ASSESSMENT

**PB91-110023**

Guides to Pollution Prevention: The Commercial Printing Industry  
EPA, Cincinnati, OH, RREL  
Jacobs Engineering Group, Inc.  
L.M. Brown  
Aug 90, 53p, EPA-625/7-90-008, PC A04/MF A01

**Abstract:** Commercial printers, who include lithographers, gravure printers, flexographers, and letterpress and screen printers, generate a variety of wastes during printing operations. The manual largely addresses the wastes and waste minimization options for offset lithographers. Waste that can be disposed of in trash include some waste paper; film; empty containers; used blankets; and damaged products and other items. The wastes result from image processing, plate making, proof making, printing, and finishing processes. Another form of waste - wastewater - results from image processing, plate making, and printing processes. Equipment cleaning wastes and air emissions are other categories of waste. Much of the waste paper generated can be recycled.

EPA ENVIRONMENTAL PROTECTION AGENCY  
PP POLLUTION PREVENTION  
27 PRINTING AND PUBLISHING

**PB91-116269**

Exploratory Assessment of the Risk of Lung Cancer Associated with Exposure to Diesel Exhaust Based on a Study in Rats. Exploratory Diesel Risk Assessment  
NIOSH  
Aug 90, 66p, PC A04/MF A04

**Abstract:** A request was made by the Mine Safety and Health Administration to assess quantitatively the risk of lung cancer among those occupationally exposed to diesel exhaust. The Armitage-Doll multi-stage model was adapted to fit both the cases of all tumors and malignant neoplasms alone. A number of assumptions were made to extend the risk estimates derived from the models of tumor response in rats to the risks for humans. These assumptions fell into three categories: those concerning the development of biologically equivalent doses for rats and humans, those relating external exposure to internal dose, and those concerning the scaling of age between rats and humans to account for the temporal aspects of exposure. Uncertainties in the study included the effects of exposure on lung clearance mechanisms, the deposition rates in humans, and the relevance of the exposure index limit. Based on the findings of the study the excess risk to miners of lung cancer at the upper range of the diesel particulate exposure reported, 1.5mg/cu m, was approximately 1.5 to 3 in 100. According to the authors, the results are consistent with previous recommendations by NIOSH that diesel exhaust should be regarded as a potential human carcinogen, and that efforts should be made to reduce exposures to the lowest feasible concentration.

CL-DIESEL DIESEL FUEL EMISSIONS  
NIOSH NATIONAL INSTITUTE FOR OCCUP. SAFETY AND HEALTH  
RA RISK ASSESSMENT  
10 METAL MINING  
12 COAL MINING  
13 OIL AND GAS EXTRACTION  
14 NONMETALLIC MINERALS, EXCEPT FUELS

**PB91-125831**

**Testing of Indoor Radon Reduction Techniques in Basement Houses Having Adjoining Wings**

EPA, Research Triangle Park, NC, AERL

Infiltec

M. Messing

Nov 90, 212p, EPA-600/8-90-076, PC A10/MF A02

**Abstract:** The report gives results of tests of indoor radon reduction techniques in 12 existing Maryland houses, with the objective of determining when basement houses with adjoining wings require active soil depressurization (ASD) treatment of both wings, and when treatment of the basement alone is sufficient. In five basement houses with adjoining slabs on grade, ASD treatment of both wings provided an incremental additional radon reduction of 0 to 5.2 pCi/L, compared to ASD treatment of either one of the slabs alone. However, basement-only treatment reduced radon to < 4 pCi/L in all five houses. In six basement houses having adjoining crawl spaces, ASD treatment of both wings (including sub-linear depressurization of the crawl space) provided little additional reduction compared to basement-only treatment, when sub-slab communication was good. When communication was not good, treatment of both wings was required to achieve < 4 pCi/L. Tests of one fully slab-on-grade house showed that, when there is good aggregate under the slab, a one-pipe sub-slab depressurization system can achieve < 1-2 pCi/L, even when there are forced-air supply ducts under the slab.

CT            CNTRL TECHNOLOGY DOC  
EPA           ENVIRONMENTAL PROTECTION AGENCY  
IA            INDOOR AIR  
10043-92-2   RADON

**PB91-126003**

**Toxic Air Pollutant Emission Factors - A Compilation for Selected Air Toxic Compounds and Sources, Second Edition**

EPA, Research Triangle Park, NC, OAQPS

Radian Corporation

A.A. Pope, et al.

Oct 90, 814p, EPA-450/2-90-011, PC A99/MF A99

**Abstract:** The report presents the second edition of the Toxic Air Pollutant Emission Factor Compilation that contains emission factors for selected air toxic compounds and sources, and associates the factors to levels of source activity. The emission factors, compiled from a review of the literature, are sorted by pollutant and source. Each factor is identified by pollutant name, CAS number, process and emission source descriptions, SIC Code and SCC's. The second edition revises and expands the report, Toxic Air Pollutant Emission Factors - A Compilation For Selected Air Toxic Compounds and Sources, Second Edition, PB89-135644. A software system, XATEF, containing the factors, has been developed for easy access and updating of the data. Use of the system is explained in the EPA report, Crosswalk/Air Toxic Emission Factor Data Base Management System User's Manual. EPA is making available the system and data base records to agency users upon request. The purpose of the report is to offer a technical service to air pollution control agencies in performing preliminary estimates of air toxics emissions. The emission factors are not intended to provide exact estimates of releases of air toxics from specific facilities.

CL-HAPS      TITLE III HAZARDOUS AIR POLLUTANTS  
CL-METAL     METALLIC COMPOUNDS  
CL-VOC       VOLATILE ORGANIC COMPOUNDS  
EF            EMISSION FACTOR  
EPA           ENVIRONMENTAL PROTECTION AGENCY

**PB91-127233**

**National Emission Standards for Asbestos. Background Information for Promulgated Asbestos NESHAP Revisions**

EPA, Research Triangle Park, NC, OAQPS

Oct 90, 260p, EPA-450/3-90-017, PC A12/MF A02

**Abstract:** Revisions to the national emission standards to control emissions of asbestos from asbestos milling, manufacturing, and fabricating plants; demolitions and renovations; and asbestos waste disposal are being promulgated under Section 112 of the Clean Air Act. The document contains summaries of public comments, EPA responses, and a summary of changes since proposal.

EPA           ENVIRONMENTAL PROTECTION AGENCY  
NESHAP       NATL EMIS STD HAZ AP  
1332-21-4     ASBESTOS  
26            PAPER AND ALLIED PRODUCTS  
262           PAPER MILLS  
2621          PAPER MILLS  
30            RUBBER AND MISC. PLASTICS PRODUCTS  
305           HOSE & BELTING & GASKETS & PACKING  
3053          GASKETS, PACKING AND SEALING DEVICES  
32            STONE, CLAY, AND GLASS PRODUCTS  
329           MISC. NONMETALLIC MINERAL PRODUCTS  
3292          ASBESTOS PRODUCTS



PB91-136523

Noncarcinogenic Effects of Chromium: Update to Health Assessment Document

EPA, Research Triangle Park, NC, ECAO

W. Victory, et al.

Apr 90, 104p, EPA-600/8-87-048F, PC A06/MF A01

Abstract: The document updates the 1984 Health Assessment Document for Chromium by addressing issues regarding noncarcinogenic health effects of chromium; oxidation states and persistence of these states in the environment; sampling and analytical methodology to differentiate these oxidation states and amounts at submicrogram ambient air levels; the degree of human exposure to chromium in the environment, both short-term and long-term; in vivo reduction of Cr (VI) to Cr (III); and effects from environmentally relevant levels on pulmonary function and renal function. Trivalent chromium is chemically stable; Cr (VI) is readily reduced to Cr (III). Oxidation state of chromium in ambient air depends on proximity to sources emitting one form over the other. Reliable monitoring methods to speciate oxidation states at ambient air levels below 1 microgram/cu m are not available. Ambient levels of total chromium (obtained from EPA's National Air Data Branch) range from a high of 0.6 microgram/cu m to below the detection limit of 0.005 microgram/cu m. Reduction of hexavalent chromium in vivo occurs in several organ systems and therefore, small amounts of inhaled Cr (VI) will be reduced before systemic absorption can occur. Trivalent chromium is an essential trace metal which potentiates actions of insulin-mediated glucose transport.

CL-CHROME CHROMIUM COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
HA HEALTH ASSESSMENT  
16065-83-1 CHROMIUM ION  
18540-29-9 CHROMIUM (VI) COMPOUNDS  
7440-47-3 CHROMIUM

PB91-137273

Indoor Air - Assessment: Methods of Analysis for Environmental Carcinogens

EPA, Research Triangle Park, NC, ECAO

M.R. Peterson, D.F. Naugle, and M.A. Berry

Jun 90, 49p, EPA-600/8-90-041, PC A03/MF A01

Abstract: The monograph describes, in a general way, published sampling procedures and analytical approaches for known and suspected carcinogens. The primary focus is upon carcinogens found in indoor air, although the methods described are applicable to other media or environments. In cases where there are no published methods for a particular pollutant in indoor air, methods developed for the workplace and for ambient air are included since they should be adaptable to indoor air. Known and suspected carcinogens have been grouped into six categories for the purposes of this and related work. The categories are radon, asbestos, organic compounds, inorganic species, particles, and non-ionizing radiation. Some methods of assessing exposure that are not specific to any particular pollutant category are covered in a separate section. The report is the fifth in a series of EPA/Environmental Criteria and Assessment Office Monographs.

CL-INORGAN INORGANIC COMPOUNDS  
CL-ORGANIC ORGANIC COMPOUNDS  
CL-PM PARTICULATE MATTER  
CL-RAD RADIATION  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
10043-92-2 RADON  
1332-21-4 ASBESTOS

PB91-141820

User's Guide to TSCREEN: A Model for Screening Toxic Air Pollutant Concentrations

EPA, Research Triangle Park, NC, OAQPS

Pacific Environmental Services

K. Stroupe, S. Boone, and C. Thames

Dec 90, 37p, EPA-450/4-90-013, PC A03/MF A01

Abstract: The user's guide describes how to start, enter/edit, use the help system, back up data and compile the TSCREEN model. TSCREEN is a model for estimating ambient pollutant concentrations for a variety of release scenarios from Superfund sites and other sources of air toxics releases. The computer program implements the procedures developed in a document entitled 'A Workbook of Screening Techniques for Assessing Impacts of Toxic Air Pollutants,' PB89-134340 and should be used in conjunction with the workbook. TSCREEN has a front-end control program that also provides, by use of interactive menus and data entry screens, the same steps as the workbook. An extensive help system is provided to guide the user. Text edit and graphical display capabilities are also provided.

CL-HAZWAST HAZARDOUS WASTES  
DM DISPERSION MODELING  
EPA ENVIRONMENTAL PROTECTION AGENCY

**PB91-148262**

Urban Air Toxics Monitoring Program, 1989  
EPA, Research Triangle Park, NC, OAQPS  
Radian Corp.  
R.A. McAllister et al.  
Oct 90, 278p, EPA-450/4-91-001, PC A13/MF A02

**Abstract:** From January 1989 through January 1990 samples of ambient air were collected at 14 sites in the eastern part of the U.S. Every 12 days, air was integrated over 24-hour periods into passivated stainless steel canisters. Simultaneously, air was drawn through cartridges containing dinitrophenylhydrazine to collect carbonyl compounds. The samples were analyzed at a central laboratory for a total of 37 halogenated and aromatic hydrocarbons, formaldehyde, acetaldehyde, and other oxygenated species. The hydrocarbon species were analyzed by gas chromatography/multiple detectors and gas chromatography/mass spectrometry, while the carbonyl species were analyzed by liquid chromatography. An extensive quality assurance program was carried on to secure high quality data. Complete data for all the carbonyl samples are presented in the report.

AM	AMBIENT MONITORING
CL-ALDEHYD	ALDEHYDES
CL-AROMHC	AROMATIC HYDROCARBONS
CL-HALOGHC	HALOGENATED HYDROCARBONS
EPA	ENVIRONMENTAL PROTECTION AGENCY
50-00-0	FORMALDEHYDE
75-07-0	ACETALDEHYDE

**PB91-148288**

Urban Air Toxics Monitoring Program Aldehyde Results, 1989  
EPA, Research Triangle Park, NC, OAQPS  
Radian Corp.  
R.A. McAllister, D.L. Epperson, R.F. Jongleux  
Jan 91, 149p, EPA-450/4-91-006, PC A07/MF A01

**Abstract:** The U.S. EPA developed the Urban Air Toxics Monitoring Program (UATMP) to help State and local agencies assess the nature and magnitude of their air toxics problems. The UATMP sampler collects ambient air samples at urban sites in 6-liter (L) SUMMA-treated stainless steel canisters. At the same time, through a separate heated sample line, ambient air samples are drawn in parallel through duplicate cartridges which trap the carbonyl compounds from the ambient air. The aldehyde cartridges collected at the UATMP sites for 1989 were extracted and analyzed by the Atmospheric Research and Exposure Laboratory (AREAL) of the U.S. EPA at Research Triangle Park, NC, for formaldehyde, acetaldehyde, and acetone. These carbonyls were selected as target compounds for the 1989 UATMP. The report presents the data summaries and other data assessments for the carbonyl samples collected during the 1989 UATMP season. The air toxics compounds collected in canisters for the 1989 UATMP season are reported separately.

AM	AMBIENT MONITORING
CL-ALDEHYD	ALDEHYDES
EPA	ENVIRONMENTAL PROTECTION AGENCY
RDG	REG DEVELOPMNT GUIDE
50-00-0	FORMALDEHYDE
67-64-1	ACETONE
75-07-0	ACETALDEHYDE

**PB91-162560**

Bioassay of Complex Mixtures of Indoor Air Pollutants. Chapter 7  
EPA, Research Triangle Park, NC, HERL  
J. Lewtas, et al.  
1990, 21p, EPA-600/D-90-242, PC A03/MF A01

**Abstract:** There are several strategies for conducting bioassay studies of indoor air pollutant mixtures. One approach is to generate indoor pollutants from sources under laboratory conditions suitable for human, animal, or in vitro bioassay studies. This approach was used extensively to evaluate tobacco smoke and to a lesser extent for other indoor combustion sources such as kerosene heaters. A second approach is to simulate these complex mixtures by simpler mixtures of pure chemicals which can be used in biological studies. The third approach, which is described in more detail here, is to use bioassays in the direct evaluation of complex mixtures of indoor air pollutants. The mixtures of organics found indoors from combustion sources, building materials, household products and human activities are extremely complex. They consist of thousands of components which are not well characterized or quantified. Many of these mixtures and certain components are potential human carcinogens. The development of short-term bioassays to detect mutagens and potential carcinogens has facilitated studies of complex mixtures including air pollutants and combustion emissions. Chapter 7 will focus on the development and application of bacterial mutagenicity assays to complex mixtures of indoor air pollutants.

CL-CARCIN CARCINOGENS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
IA INDOOR AIR  
RA RISK ASSESSMENT

**PB91-168534**

Municipal Waste Combustion: Background Information for Promulgated Standards and Guidelines. Summary of Public Comments and Responses  
EPA, Research Triangle Park, NC, OAQPS  
Radian Corporation  
Dec 90, 520p, EPA-450/3-91-004, PC A22/MF A03

**Abstract:** EPA is preparing for promulgation under Clean Air Act 111(b) emission standards for new MWC's and, under 111(d), emission guidelines for existing MWC's. The standards and guidelines will apply to MWC units with a capacity to combust 250 or more tons of municipal solid waste per day. The standards and guidelines were proposed in the Federal Register on December 20, 1989 (54 FR 52251 and 54 FR 52209). Public hearings were held in January 1990 in Boston, MA, Detroit, MI, and Seattle, WA. These meetings were open to the public and the public was given an opportunity to comment on the proposal. Additionally, EPA received over 300 written comment letters. The report summarizes all comments and presents the Agency's responses.

EPA ENVIRONMENTAL PROTECTION AGENCY  
NSPS NEW SRC PERFORMANCE STD  
11104-93-1 NITROGEN OXIDES  
49 ELECTRIC, GAS, AND SANITARY SERVICES  
495 SANITARY SERVICES  
4953 REFUSE SYSTEMS  
7446-09-5 SULFUR DIOXIDE

**PB91-168542**

Municipal Waste Combustion: Background Information for Promulgated Standards and Guidelines. Summary of Public Comments and Responses. Appendices A to C  
EPA, Research Triangle Park, NC, OAQPS  
Radian Corporation  
Dec 90, 105p, EPA-450/3-91-004A, PC A06/MF A01

**Abstract:** Appendices A to C to the 'Municipal Waste Combustion: Background Information for Promulgated Standards and Guidelines - Summary of Public Comments and Responses' (PB91-168534), address key technical issues related to the promulgated rules for municipal waste combustors (MWC's). Appendix A provides analysis of the continuous SO2 control capabilities of spray dryer/fabric filter (SD/FF) and spray dryer/electrostatic precipitator (SD/ESP) control systems for MWC's. Achievable SO2 performance levels for these systems are determined based on the analysis. Similarly, Appendix B provides analysis of continuous NOX emissions data from MWC's. Results are presented for the statistical analysis of NOX data obtained from a grate-fired mass burn waterwall MWC using selective noncatalytic reduction (SNCR) to reduce NOX emissions and from a rotary mass burn waterwall MWC designed to limit NOX emissions through combustion control. Appendix C provides additional MWC emissions test data which became available following proposal of the standards and guidelines for MWC's on December 20, 1989. The appendix reviews data at four MWC's with either unique air pollution control technologies or emissions which are higher than for similarly controlled MWC's that had been previously examined.

CT CNTRL TECHNOLOGY DOC  
EPA ENVIRONMENTAL PROTECTION AGENCY  
NSPS NEW SRC PERFORMANCE STD  
11104-93-1 NITROGEN OXIDES  
49 ELECTRIC, GAS, AND SANITARY SERVICES  
495 SANITARY SERVICES  
4953 REFUSE SYSTEMS  
7446-09-5 SULFUR DIOXIDE

PB91-168575

Air Pollutant Emission Standards and Guidelines for Municipal Waste Combustors: Revision and Update of Economic Impact Analysis and Regulatory Impact Analysis

EPA, Research Triangle Park, NC, OAQPS

Research Triangle Inst.

G.E. Morris, B.L. Jellicorse, and R. Sarmiento

Nov 90, 115p, EPA-450/3-91-003, PC A06/MF A01

Abstract: EPA is preparing for promulgation under Clean Air Act 111(b) emission standards for new Municipal Waste Combustors (MWCs) and, under 111(d), emission guidelines for existing MWCs. The standards and guidelines will apply to MWCs with a capacity to combust 35 or more Mg of municipal solid waste per day. The report updates 'Economic Impact of Air Pollutant Emission Standards for New Municipal Waste Combustors,' EPA-450/3-89-006 (August 1989), 'Economic Impact of Air Pollutant Emission Guidelines for Existing Municipal Waste Combustors,' EPA-450/3-89-005 (August 1989), and 'Regulatory Impact Analysis of Air Pollutant Emission Standards and Guidelines for Municipal Waste Combustors,' (PB90-154915, October 1989). The update describes baseline projections of MWCs, economic analysis methodology national costs and emission reductions attributable to the standards and guidelines, the sensitivity of costs to assumptions about capacity utilization and about materials separation requirements, and how the standards and guidelines may change communities' choices of waste disposal technology.

EPA	ENVIRONMENTAL PROTECTION AGENCY
NSPS	NEW SRC PRFRMCE STD
11104-93-1	NITROGEN OXIDES
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS
7446-09-5	SULFUR DIOXIDE

55 FR 08292 03-07-90

National Emissions Standards for Hazardous Air Pollutants; Benzene Emissions from Chemical Manufacturing Process Vents, Industrial Solvent Use, Benzene Waste Operations, Benzene Transfer Operations, and Gasoline Marketing System

EPA, Research Triangle Park, NC, ESD

Abstract: Final rule. This action promulgates the standards for benzene waste operations and benzene transfer operations that were proposed at 54 FR 38083, 9-14-89. These standards implement Section 112 of the Clean Air Act and are based on the Administrator's determination that benzene emissions from these source categories present a significant risk to human health. The intended effect of the standards is to require all existing, new, modified, or reconstructed sources to reduce emissions to a level which provides an ample margin of safety to protect public health. For reasons stated in Section IV of Supplementary Information of this rule, the Administrator is withdrawing the standards proposed for the industrial solvent use and gasoline marketing source categories. This action also serves as notice of the Administrator's final determination not to regulate the chemical manufacturing process vent source category. Corrections were made at 55 FR 12444, 4-3-90; 55 FR 18330, 5-2-90; and 55 FR 37230, 9-10-90.

EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NESHAP	NATL EMIS STD HAZ AP
28	CHEMICALS AND ALLIED PRODUCTS
286	INDUSTRIAL ORGANIC CHEMICALS
2865	CYCLIC CRUDES AND INTERMEDIATES
29	PETROLEUM AND COAL PRODUCTS
291	PETROLEUM REFINING
2911	PETROLEUM REFINING
33	PRIMARY METAL INDUSTRIES
331	BLAST FURNACE AND BASIC STEEL PRODUCTS
3312	BLAST FURNACES AND STEEL MILLS
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS
51	WHOLESALE TRADE-NONDURABLE GOODS
517	PETROLEUM AND PETROLEUM PRODUCTS
5171	PETROLEUM BULK STATIONS & TERMINALS
5172	PETROLEUM PRODUCTS, NEC
71-43-2	BENZENE
8006-61-9	GASOLINE

55 FR 11338 03-27-90

Review of Standards of Performance for New Stationary Sources;  
Phosphate Rock Plants  
EPA, Research Triangle Park, NC, ISB/ESD

Abstract: Review of standards. The EPA is required by the Clean Air Act to review standards of performance for new, modified, or reconstructed stationary sources every four years. The first review of the existing new source performance standards (NSPS) for phosphate rock plants (40 CFR part 60, subpart NN) has been completed to determine the need for revision of the existing standards. The EPA has concluded that no revision to the standards is appropriate at this time.

CL-PM	PARTICULATE MATTER
EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NSPS	NEW SRC PRFRMNC STD
14	NONMETALLIC MINERALS, EXCEPT FUELS
147	CHEMICAL AND FERTILIZER MINERALS
1475	PHOSPHATE ROCK
28	CHEMICALS AND ALLIED PRODUCTS
287	AGRICULTURAL CHEMICALS
2874	PHOSPHATIC FERTILIZERS

55 FR 13480 04-10-90

NESHAPS for Radionuclides Reconsideration; Phosphogypsum  
EPA, Washington, DC, ORP

Abstract: Notice of limited reconsideration of final rule and determination of compliance waiver. This action announces the limited reconsideration by EPA of the portion of 40 CFR part 61, subpart R, National Emission Standards for Hazardous Air Pollutants, Radon Emissions from Phosphogypsum Stacks (54 FR 51654 12-15-89) that requires disposal of phosphogypsum in stacks or mines, thereby precluding alternative uses of the material. In light of this reconsideration and other factors described herein, EPA is also granting a limited compliance waiver that permits the continued agricultural use of phosphogypsum through the current growing season. EPA is establishing a 60-day comment period to receive information relating to the limited reconsideration. In the same issue of the Federal Register, EPA is also noticing several proposed alternatives that address the subject matter of this limited reconsideration. (See the proposed rule printed elsewhere in the issue.) A public hearing on these issues was held.

CL-PHOSPHA	PHOSPHATES
CL-RAD	RADIATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NESHAP	NATL EMIS STD HAZ AP
28	CHEMICALS AND ALLIED PRODUCTS
287	AGRICULTURAL CHEMICALS
2874	PHOSPHATIC FERTILIZERS

55 FR 13482 04-10-90

NESHAPS for Radionuclides Reconsideration  
EPA, Washington, DC, ORP

Abstract: Notice of proposed rule. This action announces the limited reconsideration by EPA of the portion of 40 CFR part 61, subpart R, National Emission Standards for Hazardous Air Pollutants, Radon Emissions from Phosphogypsum Stacks (54 FR 51654 12-15-89) that requires disposal of phosphogypsum in stacks or mines, thereby precluding alternative uses of the material. In light of this reconsideration and other factors described herein, in a document published at 55 FR 13480 (4-10-90), EPA is also granting a limited compliance waiver that permits the continued agricultural use of phosphogypsum through the current growing season. This action further notices four alternatives for rulemaking by which EPA is proposing to maintain or modify the rule.

CL-PHOSPHA	PHOSPHATES
CL-RAD	RADIATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NESHAP	NATL EMIS STD HAZ AP
28	CHEMICALS AND ALLIED PRODUCTS
287	AGRICULTURAL CHEMICALS
2874	PHOSPHATIC FERTILIZERS

55 FR 26912 06-29-90

Standards of Performance for New Stationary Sources; Volatile Organic Compound (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Air Oxidation Processes  
EPA, Research Triangle Park, NC, ESD

Abstract: Final rule. Standards of performance for air oxidation unit processes in the SOCMI were proposed in the Federal Register on October 21, 1983 (48 FR 48932). On May 16, 1985, the public comment period was reopened (50 FR 20446) for the purpose of allowing public comment on the results of a reanalysis of the costing procedures, the total resource effectiveness (TRE) equation and coefficients, and the designation of affected facility. This action promulgates standards of performance for SOCMI air oxidation unit processes. These standards implement Section 111 of the Clean Air Act (CAA) and are based on the Administrator's determination that VOC emissions from air oxidation processes in the SOCMI cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. The intended effect of these standards is to require all new, modified, and reconstructed air oxidation facilities to achieve an emission reduction that reflects the capabilities of the best demonstrated system of continuous emission reduction, considering costs, nonair quality health, and environmental and energy impacts. Corrections made at 55 FR 36932 9-7-90.

CL-VOC	VOLATILE ORGANIC COMPOUNDS
EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NSPS	NEW SRC PRFRMNC STD
28	CHEMICALS AND ALLIED PRODUCTS

55 FR 26931 06-29-90

Standards of Performance for New Stationary Sources; Volatile Organic Compound (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations  
EPA, Research Triangle Park, NC, ESD

Abstract: Final rule. Standards of performance for distillation unit operations in the SOCMIs were proposed in the Federal Register on December 30, 1983 (48 FR 57538). On May 16, 1985, the public comment period was reopened (50 FR 20446) for the purpose of allowing public comment on revisions to the affected facility designation and the costing procedures. This action promulgates standards of performance for SOCMIs distillation unit operations. These standards implement Section 111 of the Clean Air Act (CAA) and are based on the Administrator's determination that VOC emissions from SOCMIs cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. The intended effect of these standards is to require all new, modified, and reconstructed distillation facilities to achieve an emission reduction that reflects the capabilities of the best demonstrated system of continuous emission reduction, considering costs, nonair quality health, and environmental and energy impacts. Corrections made at 55 FR 36932 9-7-90.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
FR FED REGISTER NOTICES  
NSPS NEW SRC PRFRMCE STD  
28 CHEMICALS AND ALLIED PRODUCTS

55 FR 26953 06-29-90

Standards of Performance for New Stationary Sources; Volatile Organic Compound (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes  
EPA, Research Triangle Park, NC, ESD

Abstract: Proposed rule and notice of public hearing. The proposed standards would limit the emissions of VOC from new, modified, and reconstructed SOCMIs reactor process facilities. The proposed standards implement Section 111 of the Clean Air Act (CAA) and are based on the Administrator's determination that emissions from the SOCMIs cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. The intent is to require new, modified, and reconstructed SOCMIs reactor process facilities to control emissions to the level achievable by the best demonstrated system of continuous emission reduction, considering costs, nonair quality health and environmental impacts, and energy requirements.

CL-VOC VOLATILE ORGANIC COMPOUNDS  
EPA ENVIRONMENTAL PROTECTION AGENCY  
FR FED REGISTER NOTICES  
NSPS NEW SRC PRFRMCE STD  
28 CHEMICALS AND ALLIED PRODUCTS

55 FR 28346 07-10-90

National Emission Standards for Hazardous Air Pollutants; Revisions to Vinyl Chloride; Equipment Leaks of Volatile Hazardous Air Pollutants  
EPA, Research Triangle Park, NC, ESD

Abstract: Final rule. On September 21, 1989 (54 FR 38938), EPA proposed minor revisions to national emission standards for vinyl chloride (VC) and equipment leaks of volatile hazardous air pollutants. The revisions to the national emission standards for hazardous air pollutants (NESHAP) were proposed as a result of petitions for reconsideration and review filed by the Society of the Plastics Industry, Inc., Dow Chemical Company, Georgia Gulf Corporation, and Vista Chemical Company. This action promulgates final revisions to the NESHAP. The intended effect of this action is to grant the petitioners' request for clarification of ambiguities in several definitions and in the applicability of certain regulatory requirements in the standards. This notice is not intended to address the July 28, 1987, decision by the D.C. Circuit Court on the VC standards, Natural Resources Defense Council, Inc. v. EPA, 824 F.2d 1146 (1987). Any response to that decision will be made in a future notice in the Federal Register.

EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NESHAP	NATL EMIS STD HAZ AP
28	CHEMICALS AND ALLIED PRODUCTS
286	INDUSTRIAL ORGANIC CHEMICALS
2869	INDUSTRIAL ORGANIC CHEMICALS, NEC
75-01-4	VINYL CHLORIDE

55 FR 37674 09-12-90

Standards of Performance for New Stationary Sources; Small Industrial-Commercial-Institutional Steam Generating Units  
EPA, Research Triangle Park, NC, ESD

Abstract: Final rule. This action promulgates standards of performance for new, modified, and reconstructed small industrial-commercial-institutional steam generating units with a maximum design heat input capacity of 29 MW (100 million Btu/hr) or less, but greater than or equal to 2.9 MW (10 million Btu/hr). These standards, codified in subpart Dc of 40 CFR part 60, limit emissions of SO<sub>2</sub> and PM from these sources. This notice also announces the EPA's decision not to regulate NO<sub>x</sub> emissions from these units. Standards of performance limiting emissions of SO<sub>2</sub>, PM, and NO<sub>x</sub> from small industrial-commercial-institutional steam generating units were proposed in 54 FR 24792, 6-9-89. The standards implement Section 111 of the Clean Air Act and are based on the Administrator's determination that small industrial-commercial-institutional steam generating units cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. The intended effect of these standards is to require all new, modified, and reconstructed small industrial-commercial-institutional steam generating units to control emissions to the level achievable by the best demonstrated technological system of continuous emission reduction considering costs, nonair quality health, environmental, and energy impacts.

CL-PM	PARTICULATE MATTER
EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NSPS	NEW SRC PERFORMANCE STD
11104-93-1	NITROGEN OXIDES
49	ELECTRIC, GAS, AND SANITARY SERVICES
491	ELECTRIC SERVICES
4911	ELECTRIC SERVICES
7446-09-5	SULFUR DIOXIDE

55 FR 38057 09-17-90

Radionuclide NESHAP  
EPA, Washington, DC, ORP

Abstract: Notice of stay. This action announces a further 180-day stay, pending reconsideration and judicial review, of Subpart I of 40 CFR part 61 ("Subpart I"), National Emission Standards for Hazardous Air Pollutants for Radionuclide Emissions from Facilities Licensed by Nuclear Regulatory Commission and Non-DOE Federal Facilities (54 FR 51654 12-15-89). EPA is issuing this stay pursuant to the authority inherent to EPA's general rulemaking authority under Clean Air Act Section 301(a), 42 USC 7601(a), and also pursuant to Section 10(d) of the Administrative Procedure Act, 5 USC 705, which grants the Administrator discretion to postpone the effective date of Agency rules pending judicial review, which for Subpart I is ongoing in the United States Court of Appeals for the DC Circuit. This action continues in place of the existing stay originally granted by the Administrator pursuant to Clean Air Act Section 307(d) (7) (B), 42 USC 7607(d) (7) (B), 54 FR 51654 (12-15-89), and subsequently extended pursuant to the presently applicable authorities on March 15, 1990, 55 FR 10455 (3-21-90), and on July 12, 1990, 55 FR 29205 (7-18-90).

CI-RAD	RADIATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NESHAP	NATL EMIS STD HAZ AP
10	METAL MINING
109	MISCELLANEOUS METAL ORES
1094	URANIUM-RADIUM-VANADIUM ORES
28	CHEMICALS AND ALLIED PRODUCTS
281	INDUSTRIAL INORGANIC CHEMICALS
2819	INDUSTRIAL INORGANIC CHEMICALS, NEC
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS
96	ADMINISTRATION OF ECONOMIC PROGRAMS
963	REGULATION, ADMIN. OF UTILITIES
9631	REGULATION, ADMIN. OF UTILITIES

55 FR 40171 10-02-90

Standards of Performance for New Stationary Sources Amendments to Subpart J (Petroleum Refineries) and Addition of Performance Specification 7 to Appendix B  
EPA, Research Triangle Park, NC, EMS

Abstract: Final rule. The purpose of this action is five-fold: (1) To require (as opposed to being an option) the monitoring of sulfur dioxide (SO<sub>2</sub>) in gases discharged into the atmosphere from the combustion of fuel gases or, as an alternative, the monitoring of hydrogen sulfide (H<sub>2</sub>S) in fuel gases; (2) to delete the mention of controlling SO<sub>2</sub> after combustion of fuel gases; (3) to delete the monitoring requirement of H<sub>2</sub>S in gases discharged into the atmosphere from Claus sulfur recovery plants, but require the monitoring of other reduced sulfur compounds using continuous emission monitoring systems (CEM's) or SO<sub>2</sub> CEMS's after oxidizing the reduced sulfur compounds to SO<sub>2</sub>; (4) to add Performance Specification (PS) 7 for H<sub>2</sub>S CEMS's to Appendix B of this part; and (5) to clarify ambiguities in the existing regulations. All affected fuel gas combustion devices and Claus plants in petroleum refineries, subject to subpart J of 40 CFR part 60, will be required to install and operate CEMS's within 1 year of the promulgation date. These monitoring requirements are not new, but previous H<sub>2</sub>S and reduced sulfur CEMS installations were contingent upon the Agency's promulgation of PS's. These amendments were published in the Federal Register on March 1, 1989 (54 FR 8564) and April 28, 1989 (54 FR 18308).

EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NSPS	NEW SRC PERFORMANCE STD
29	PETROLEUM AND COAL PRODUCTS
291	PETROLEUM REFINING
2911	PETROLEUM REFINING
7446-09-5	SULFUR DIOXIDE
7783-06-4	HYDROGEN SULFIDE

55 FR 40834 10-05-90

National Emission Standards for Radon Emissions from Phosphogypsum Stacks  
EPA, Washington, DC, ORP

Abstract: Notice of compliance waiver. This action announces the continuation of a limited compliance waiver, pending reconsideration and rulemaking, of subpart R of 40 CFR part 61 ("Subpart R"), National Emission Standards for Radon Emissions from Phosphogypsum Stacks (54 FR 51654 December 15, 1989). EPA is issuing this compliance waiver pursuant to its authority under Clean Air Act 112(c)(1)(B)(ii) and 40 CFR 60.10-60.11. This limited compliance waiver, which permits the distribution and use of phosphogypsum for agricultural purposes, temporarily continues the existing limited compliance waiver, originally issued by the Administrator on April 10, 1990 (55 FR 13480), pending final action on the ongoing rulemaking proceedings, but in no event beyond June 1, 1991.

CL-PHOSPHA	PHOSPHATES
EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NESHAP	NATL EMIS STD HAZ AP
10043-92-2	RADON
28	CHEMICALS AND ALLIED PRODUCTS
281	INDUSTRIAL INORGANIC CHEMICALS
2819	INDUSTRIAL INORGANIC CHEMICALS, NEC
287	AGRICULTURAL CHEMICALS
2874	PHOSPHATIC FERTILIZERS

55 FR 40879 10-05-90

Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Municipal Waste Combustors  
EPA, Research Triangle Park, NC, ESD

Abstract: Supplemental information on mercury emissions. Standards of performance (i.e., new source performance standards) for new, modified, and reconstructed municipal waste combustors (MWC's) and emission guidelines for existing MWC's were proposed in the Federal Register on December 20, 1989 (54 FR 52209). This notice announces the availability of supplemental information on mercury emissions from MWC's for review and comment.

EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NSPS	NEW SRC PERFORMANCE STD
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS
7439-97-6	MERCURY



**55 FR 45804 10-31-90**

National Emission Standards for Hazardous Air Pollutants; Benzene Emissions from Chemical Manufacturing Process Vents, Industrial Solvent Use, Benzene Waste Operations, Benzene Transfer Operations, and Gasoline Marketing System; Correction  
EPA, Research Triangle Park, NC, ESD

Abstract: Final rule; correction. This document clarifies the applicability of Section 61.300(a) of the National Emission Standard for Benzene Transfer Operations which was promulgated in the Federal Register on Wednesday, March 7, 1990 (55 FR 8341). This action is necessary to clarify that the benzene transfer rule does not apply to the loading of crude oil, natural gas liquids or petroleum distillates such as fuel oil, diesel or kerosene. It was never EPA's intent that the benzene transfer rule apply to crude oil, natural gas liquids or petroleum distillates. The benzene content of these materials is well below the 70 percent cutoff in the regulation and will never approach this cutoff. The notice also changes the applicability date of Sec-61.300(a) of the regulation as it applies to the loading of benzene into marine vessels. This change is necessary to allow facilities adequate time to design, purchase and install vapor control systems that comply with the U.S. Coast Guard standards that were issued June 21, 1990 (55 FR 25396) and that are effective July 23, 1990. This correction is consistent with EPA's intent to provide an industry-wide waiver of 1 year so that facilities can take into consideration the Coast Guard standards that address safe design, installation and operation of marine vessel vapor control systems.

EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NESHAP	NATL EMIS STD HAZ AP
28	CHEMICALS AND ALLIED PRODUCTS
286	INDUSTRIAL ORGANIC CHEMICALS
2865	CYCLIC CRUDES AND INTERMEDIATES
29	PETROLEUM AND COAL PRODUCTS
291	PETROLEUM REFINING
2911	PETROLEUM REFINING
33	PRIMARY METAL INDUSTRIES
331	BLAST FURNACE AND BASIC STEEL PRODUCTS
3312	BLAST FURNACES AND STEEL MILLS
49	ELECTRIC, GAS, AND SANITARY SERVICES
495	SANITARY SERVICES
4953	REFUSE SYSTEMS
51	WHOLESALE TRADE-NONDURABLE GOODS
517	PETROLEUM AND PETROLEUM PRODUCTS
5171	PETROLEUM BULK STATIONS & TERMINALS
5172	PETROLEUM PRODUCTS, NEC
71-43-2	BENZENE
8006-61-9	GASOLINE

**55 FR 48406 11-20-90**

National Emission Standards for Hazardous Air Pollutants; Asbestos  
NESHAP Revision  
EPA, Research Triangle Park, NC, ISB

Abstract: Final rule. This Federal Register notice promulgates rules under Section 112 of the Clean Air Act for asbestos emissions and is based on the Administrator's determination that asbestos presents a significant risk to human health as a result of air emissions from one or more source categories and is therefore a hazardous air pollutant (see 36 FR 03031 03-31-71). The purpose of the revisions promulgated in this notice is to enhance enforcement and promote compliance with the current standard without altering the stringency of existing controls. On January 10, 1989 the EPA proposed amendments to the asbestos NESHAP that would require control device and fugitive emission monitoring, recordkeeping, and reporting for asbestos milling, manufacturing, and fabricating operations. For planned demolitions and renovations, revisions to the notification requirements were proposed, and safety was added as a reason for exemption from the use of wet removal methods. Recordkeeping requirements were proposed for asbestos waste disposal. Clarifying revisions to several definitions and provisions were also proposed. Numerous comments were received on the proposed revisions, and this notice responds to those comments, and incorporates changes as a result of those comments. Corrections were made at 56 FR 1669 1-16-91.

EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NESHAP	NATL EMIS STD HAZ AP
1332-21-4	ASBESTOS
15	GENERAL BUILDING CONTRACTORS
152	RESIDENTIAL BUILDING CONSTRUCTION
154	NONRESIDENTIAL BUILDING CONSTRUCTION
16	HEAVY CONSTRUCTION, EX. BUILDING
17	SPECIAL TRADE CONTRACTORS
179	MISC. SPECIAL TRADE CONTRACTORS
1795	WRECKING AND DEMOLITION WORK

55 FR 51010 12-11-90

Standards of Performance for New Stationary Sources; Polypropylene,  
Polyethylene, Polystyrene, and Poly(ethylene terephthalate)  
Manufacturing Industry  
EPA, Research Triangle Park, NC, ESD

Abstract: Final rule. Standards of performance to limit volatile organic compound (VOC) emissions from new, modified, and reconstructed process sections at certain polymer manufacturing plants were proposed in the Federal Register on 9-30-87 (52 FR 36678). A new approach for determining which process emissions from polypropylene and polyethylene production would be subject to the proposed standards was presented for public comment in the Federal Register on 1-10-89 (54 FR 890). This action promulgates these standards of performance for polypropylene, polyethylene, and poly(ethylene terephthalate) (PET) plants. These standards implement Section 111 of the Clean Air Act and are based on the Administrator's determination that emissions from these polymer manufacturing facilities cause, or contribute significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare. The intended effect of these standards is to require all new, modified, and reconstructed process sections at these polymer manufacturing plants to achieve emission levels that reflect the best demonstrated system of continuous emission reduction considering costs, non-air quality health, and environmental and energy impacts.

CL-VOC	VOLATILE ORGANIC COMPOUNDS
EPA	ENVIRONMENTAL PROTECTION AGENCY
FR	FED REGISTER NOTICES
NSPS	NEW SRC PERFORMANCE STD
25038-59-9	POLY (OXYETHYLENE OXYTEREPHTHALOYL)
25322-69-4	POLYPROPYLENE GLYCOL
30	RUBBER AND MISC. PLASTICS PRODUCTS
308	MISCELLANEOUS PLASTICS PRODUCTS, NEC
9002-88-4	POLYETHYLENE
9003-53-6	STYRENE, POLYMERS

APPENDIX A

INDEX TO NATIONAL AIR TOXICS INFORMATION CLEARINGHOUSE

NEWSLETTER: DECEMBER 1983 THROUGH MAY 1991

## ABOUT THE NEWSLETTERS

The National Air Toxics Information Clearinghouse Newsletter is published by the Clearinghouse to inform interested persons of current activities related to toxic air pollutants. To be placed on the mailing list, contact the Clearinghouse staff at (919) 541-0850 or (FTS) 629-0850.

## HOW TO USE THIS INDEX

Alphabetically arranged key word headings (in boldface type) are followed by a subheading describing the context in which the key word appears in the indexed Newsletter article. The title of the article itself is not given since, for example, an article on California's process of identifying and controlling toxic air pollutants might discuss at length, or, at the other end of the scale, briefly mention, a good many topics of interest to Newsletter readers. Both broad topics of discussion and brief mentions of an item are indexed for the sake of completeness.

The subentry is followed in turn by a locator consisting of the Newsletter month and year plus page number on which the information may be found. Subsequent references to the key word in other Newsletters are separated by semicolons and have their own subentry phrases as necessary. Thus, the entry, Acetaldehyde, tells the reader that he may find that substance referred to in the context of California's air toxics identification and control process on page 5 of the December 1984 Newsletter. The second locator tells the reader that further information on acetaldehyde in the same context (in this case, California revised the list mentioned in the December 1984 article) may be found on page 6 of the May 1985 issue.

A number in parentheses is the page number assigned by order; the first issue of the Newsletter did not have page numbers.

**AALs:** See Ambient levels, acceptable

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**Coke oven emissions:** Sept 1988, 10; Mar 1989, 10; May 1990, 8; health effects of, Jan 1989, 9; Indiana rule to reduce, May 1990, 8; recovery plants and benzene, Feb 1984, 2; reductions called for under benzene rule, Dec 1989, 11; regulatory status of under Clean Air Act, Dec 1985, 10

**Colorado:** Denver "Brown Cloud" study released, Jan 1990, 2, 11

**Combustion:** see also Incineration; EPA air toxics strategy and incomplete combustion, Aug 1985, 3-5; EPA report on hospital incinerators, Nov 1987, 5-6; IARC study of woodstove emissions described, June 1987, 10; and landfill gas incinerators, July 1990, 6-7; of municipal waste, workshop on, Mar 1987, 8

**Combustion, coal and oil:** Sept 1989, 9

**Combustion, municipal waste:** Nov 1988, 3; Sept 1989, 9; Air RISC plans brochures on, May 1991, 10; ECAO model assesses indirect human exposures to, May 1991, 7-8; NSPS sets siting requirements, Mar 1991, 8-9; OAQPS sets standards for, Mar 1991, 8-9; STAPPA/ALAPCO comment on proposed regulation for, July 1990, 7; study conducted by CTC/NESCAUM, June 1987, 5; test protocol for development by CTC/NESCAUM, Mar 1988, 9

**Combustion, residential wood-fired:** Mar 1989, 11; Sept 1989, 5, 7; and Denver "Brown Cloud" study, Jan 1990, 11; and emission of carcinogens from, May 1985, 2-3; and IACP field studies, Dec 1985, 5-7; and OAQPS development of NSPS on, May 1985, 3-5; Aspen, CO, regulation on, June 1986, 7-8; regulation adopted in Puget Sound to control emissions from, March 1990, 6; sampling methods for, Sept 1988, 11-12; studied by IACP, Nov 1988, 3-4

**Combustion sources:** Nov 1988, 3; National Tier 4 dioxin study and, Nov 1987, 8

**Community Right-to-Know provisions:** under SARA Title III. See **SARA Title III**

**Compliance, certifications of:** Title V program to require, May 1991, 1-2

**Compliance Data System (CDS):** introduced by EPA, Jan 1989, 9-10

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):** Apr 1984, 3; July 1989, 10-11; Dec 1989, 9; and Massachusetts Toxics Use Reduction Act, Sept 1990, 8; Reportable Quantity Provisions in, June 1986, 3; Region 6 inspection program and, June 1986, 5

**Connecticut:** air toxics control program, Dec 1983 (7); develops MWC test protocol, Mar 1988, 9; regulation to control toxic air pollutants described, Sept 1986, 4-5

**Consent decree:** issued in Philadelphia incinerator testing, Sept 1986, 9

**Consumer products:** OAQPS begins study of, Jan 1990, 8; Oregon regulates CFC; halon-containing, Nov 1990, 7-8

**Contingency Preparedness Plans:** and EPA air toxics strategy, Aug 1985, 6

**Control of Air Toxics (CAT):** CTC/AEERL can now use in modeling, Sept 1989, 9

**Control Programs Development Division (CPDD):** and State/local air pollution control agencies, June 1986, 9-10

**Control technology:** AEERL research on, Feb 1985, 2-3; California agency rule defines, Mar 1988, 3; carbon adsorption as, Dec 1985, 3; for chrome plating industry, Mar 1988, 5; cost of, Dec 1985, 3; evaluated for Denver's "Brown Cloud" study, Jan 1990, 2, 11; evaluating alternatives under NESCAUM guideline, Jan 1989, 6-7; under hazardous organic NESHAP, Sept 1987, 12; for hospital incinerators, Nov 1987, 6; and indoor radon levels, Mar 1986, 3-5; for landfill gas, July 1990, 5-6; limits of New Jersey approach to, July 1989, 6; STAPPA/ALAPCO finds need for information on, Dec 1989, 10; workshop on, Mar 1988, 11

**Control Technology Center (CTC):** Mar 1991, 5; June 1987, 4-5; Jan 1988, 9; Mar 1988, 8-9; May 1989, 6-7; May 1991, 9; develops permit review software, May 1988, 8; described, Dec 1986, 2-3; functions of, Nov 1988, 8; issues air toxics reports, Dec 1989, 5-6; new computer models described Sept 1989, 9; program growth described, Sept 1988, 4-5

**Cooling towers, comfort:** Jan 1989, 4; EPA proposes chromium ban in, May 1988, 9; EPA publishes final chromium standards, Sept 1990, 8-9

**Copper:** May 1990, 5, 6

**Copper smelters, primary:** as inorganic arsenic emissions sources, Sept 1984, 9

**Cotton gins:** as inorganic arsenic emissions sources, Sept 1984, 9

**Cresol:** May 1985, 6; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5

**Criteria pollutants:** May 1991, 4; Florida seeking information on ambient monitoring of, Dec 1986, 11; defined, Dec 1983 (1); included in Connecticut air toxics regulation, Sept 1986, 4; New Jersey bases air toxics program on, July 1989, 6-7

**Cumene:** verified RfC, Nov 1990, 2

**Data LOG'r™:** Dec 1986, 9

**Degreasing:** Nov 1990, 1; Sept 1988, 3; Rhode Island regulation of, Mar 1987, 6; work group examines solvent exposure on, Nov 1987, 7-8

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**Dimethylphthalate:** RfC non-verifiable, Nov 1990, 3

**Di-N-butylphthalate:** May 1990, 5; RfC non-verifiable, Nov 1990, 3

**Di-N-octylphthalate:** May 1990, 5, 6

**Dioxane, 1,4-:** May 1985, 6; July 1989, 7; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5

**Dioxins:** See also PCDDs, tetrachlorodibenzo-p-dioxins; Sept 1987, 9; in city incinerator ESP, Sept 1986, 9; and combustion source study, July 1984, 7; effects of in Ohio study, Nov 1988, 2-3; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; EPA national strategy on, Apr 1984, 2-3; and hospital incinerators, Nov 1987, 5-6; and municipal waste combustor standard, Mar 1991, 8-9; National Tier 4 study results, Nov 1987, 8; regulatory status of under Clean Air Act, Dec 1985, 10; testing for at incinerator, Sept 1986, 8-9

**Diphenylthiourea (DPT), emissions of:** and damage to vegetation, Feb 1985, 4

**Dispersion calculations:** used in study of emissions from chemical plant, Feb 1985, 4

**Dispersion models:** May 1989, 6; Jan 1990, 7; carried out in Chicago cancer risk assessment, Mar 1989, 10-11; evaluation of performance of, Apr 1984, 5; improvements suggested, Jan 1988, 8; Kentucky regulation requires, May 1988, 3; Philadelphia uses to predict ground level concentration, July 1989, 9; PIPQUIC used in executing, July 1989, 4; predicted ambient concentrations in Kansas, Jan 1988, 6-7; and risk assessment/management, Feb 1984, 2; role in Wisconsin air toxics program, Sept 1986, 3-4; used in Ontario, Mar 1988, 7; used in New York's calculations of PCD-dioxin levels, Sept 1986, 8; used in Ohio sampling study, Nov 1988, 2-3

**District of Columbia:** joins air management association, May 1990, 2

**Dry cleaning:** Nov 1990, 1; Sept 1988, 3; Florida regulation of facilities described, Mar 1987, 3; work group examines solvent exposure in, Nov 1987, 7-8

**Emergency response programs:** California agency's emergency response team described, June 1987, 2-3; and Chemical Emergency Preparedness Program (CEPP), June 1986, 2-4; commission (ERC) required by SARA Title III, Dec 1986, 6; National Governors' Association report on, Sept 1987, 14; and SARA Title III, Dec 1986, 5-6; South Carolina agency program described, Sept 1987, 5

**Emission factors:** compiled for air toxics by OAQPS, Jan 1989, 14; developed for benzene, Jan 1990, 1; development called for by States, Jan 1988, 7; for fugitive emissions, Jan 1990, 2-3; included in CARB technical

**Emission factors (continued):** guidance manual, Mar 1990, 10; in OAQPS pollutant/source data base, Sept 1990, 9; new OAQPS branch focuses on, Jan 1991, 6

**Emission inventories:** June 1986, 10; May 1989, 6; Sept 1990, 5; California agency's compilation of described, Mar 1987, 3; California establishes program for, July 1988, 5-6; conducted in Chicago cancer risk assessment, Mar 1989, 10; conducted in South Dakota to begin air toxics program development, Nov 1987, 3; conducted in urban air toxics programs, Sept 1987, 7; EPA compilation of, Mar 1987, 11-12; EPA surveys Chicago area, Nov 1987, 6-7; EPA/OAQPS publishes document on, Dec 1986, 10; information in NATICH data, 9-10; and Massachusetts use reduction act, Sept 1990, 8; and NATICH data base contents, June 1986, 1-2; new OAQPS branch focuses on, Jan 1991, 6; prepared by Ontario, Mar 1988, 7; prepared under SARA Title III reporting requirements, Sept 1987, 11-12; procedures manual on preparation of, Mar 1986, 11; RAPCA completes for point sources, Jan 1989, 7-8; requirements for under California regulation; Mar 1990, 2; Rhode Island uses in air toxics regulatory decisions, Sept 1988, 2-3; TACB data on, Jan 1988, 3; TACB uses to predict health impacts, May 1991, 1-2; topic at STAPPA/ALAPCO conference, Dec 1984, 2; techniques, Feb 1984, 4; waferboard plant assessed by CTC, June 1987, 4-5

**Emission Measurement Technical Information Center (EMTIC):** Mar 1991, 5; activities highlighted, Jan 1991, 7; established by EPA, Mar 1989, 7; and OAQPS bulletin board, Sept 1990, 10-11

**Emissions estimation:** covered in CAPCOA source assessment manual, Dec 1986, 5

**Emissions, fugitive:** See also Equipment leaks; and California agency rule, Mar 1988, 2; Chattanooga-Hamilton County study addresses 1,3-butadiene, May 1991; of toxic chemicals from equipment leaks, Jan 1990, 2-3

**Emissions, testing:** See also Source sampling, Stack sampling; EMTIC release information filing system for, Jan 1991, 7

**Environmental Criteria and Assessment Office (ECAO):** Mar 1991, 2; Jan 1988, 9; develops indirect human exposure assessment method, May 1991, 7-8

**Environmental effects:** SARA Section 313 data base introduced, Sept 1988, 13-14

**Environmental Monitoring Systems Laboratory (EMSL):** Jan 1988, 8

**Environmental Protection Agency (EPA):** See also entries under specific offices, regions; acrylonitrile sources, prototype scheme for handling, Sept 1984, 3; and Agency Prevention Work Group, June 1986, 4; arsenic Section 112 rulemaking, Sept 1984, 9; benzene storage facilities as benzene emission source, rulemaking on, Sept 1984, 9; carcinogens, airborne, IACP project identifying, Mar 1986, 7; Chemical Activity Status Report (EPA CASR), defined, Feb 1984, 3; develops hazardous

**Environmental Protection Agency (EPA) (continued):** organic NESHAP, Sept 1987, 12; develops radon risk communication program, Sept 1988, 6-7; encourages co-control of pollutant emissions, Jan 1989, 3-6; examines ozone attainment, Nov 1987, 4-5; and hazardous waste TSDF, Apr 1984, 5; hotline for, Dec 1985, 11; issues report on indoor air, May 1988, 11; national air toxics strategy section on urban toxics, Mar 1987, 9-10; studies air toxics/cancer link, Nov 1988, 9; operates risk assessment forum, Nov 1988, 7-8; outlines policy approaches for benzene regulation, Sept 1988, 9-11; plans regulation of municipal waste disposal, Sept 1987, 8-9; prepares indoor air quality plan for Congress, Sept 1987, 7-8; prepares permit review support, Mar 1987, 11; proposes ban on chromium in cooling towers, May 1988, 9; proposes Title V operating permits program, May 1991, 2; report on hospital incinerators, Nov 1987, 5-6; reviews multi-year development plan progress, Mar 1987, 11; role in indoor air quality, Mar 1989, 8-9; strategy to control both routine and accidental releases, June 1986, 8-10; studies ethylene oxide control technology, May 1988, 9-10; technical support for multi-year development plan (MYDP), June 1986, 9; toxic air pollutants, prototype scheme for handling, Sept 1984, 3-4; trichloroethylene and perchloroethylene, decisions on, Mar 1986, 9; urban air toxics progress in all regions described, Sept 1987, 6-7

**Epichlorohydrin:** May 1985, 6; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; and EPA report on locating and estimating emissions of, Dec 1985, 11; EPA draft source/emission factor report on, Dec 1984, 9; regulatory status of under Clean Air Act, Dec 1985, 10; TACB reviews sources of, Jan 1988, 3; verified RfC, Nov 1990, 2

**Epigenetic mechanisms:** and drafting carcinogen policy, Dec 1983 (6)

**Equipment leaks:** Reg Neg complete for, Mar 1991, 8

**Ethylbenzene:** May 1991, 9; and EPA/IEMD ambient monitoring program, Apr 1984, 5-6; and Michigan's use of air stripping of VOCs, Dec 1985, 4

**Ethylbenzene/styrene:** plants as benzene emissions source (EPA rulemaking on), Sept 1984, 9; process vents and CAA rulemaking, Feb 1984, 2

**Ethylene dibromide:** May 1985, 6; July 1989, 7; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; process vents, Sept 1988, 10

**Ethylene dichloride:** May 1985, 6; Dec 1985, 11; Sept 1987, 12; July 1989, 7, 9; May 1990, 5, 8; California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; EPA reports on, July 1984, 6; and EPA/IEMD ambient monitoring program, Apr 1984, 5-6; facility-specific reduction program in Puget Sound, Mar 1990, 6-7; and Michigan's Use of Air Stripping of VOCs, Dec 1985, 4; regulatory status of under Clean Air Act, Dec 1985, 10

**Ethylene oxide:** May 1985, 6; Sept 1987, 12; Jan 1989, 4; May 1990, 8; July 1990, 9; Nov 1990, 1; as contributor to air toxics problem, Sept 1984, 2-3; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; control devices for hospital use as sterilant, July 1988, 10; control devices for, May 1988, 9-10; Nebraska investigates use as sterilizer, Sept 1989, 3; NESHAP for, May 1990, 9; OAQPS publishes new document on, Dec 1986, 10; regulatory status of under Clean Air Act, Dec 1985, 10; Santa Barbara APCD writes new rule on, July 1990, 2-3

**Ethylene glycol monobutyl ether:** verified RfC, Nov 1990, 2

**Ethylenimine:** July 1989, 7

**Exposure assessment:** Sept 1990, 5; carried out for sludge disposal rule, Jan 1990, 7; conducted for California ethylene oxide rule, July 1990, 2-3; covered in CAPCOA source assessment manual, Dec 1986, 5; ECAO develops model for indirect human, May 1991, 7-8; EPA risk assessment guidelines available on, July 1988, 11; HEM II available for, May 1991, 3

**Exposure Assessment Group (EAG):** Jan 1988, 9

**Exposure modeling:** see Modeling, exposure

**Extractable Organic Matter (EOM):** May 1989, 5; measured in IACP study, Nov 1988, 3-4

**Extraction processes:** as sources of radionuclide emissions, Dec 1984, 7

**Fees:** Mar 1990, 2; Florida county adopts schedule for asbestos, Sept 1990, 3-4; for permit emissions levied by State governments, June 1987, 11; schedule for required under California air toxics regulation

**Film making:** New York firm to reduce methylene chloride emissions from, Sept 1989, 4-5

**Fish processing plants:** and Alaska ammonia standard, Mar 1991, 1-2

**Florida:** air toxics working group (FLATWG) activities described, Mar 1991, 4; agency seeking information on ambient monitoring, Dec 1986, 11; asbestos NESHAP enforcement delegated, Sept 1990, 4; considers air toxics during soil cleanup, Jan 1990, 1, 10; dry cleaning facility regulations described, Mar 1987, 3; Hillsborough County adopts asbestos fee schedule, Sept 1990, 3-4

**Florida Air Toxics Working Group (FLATWG):** drafts Air Toxics Source Review Strategy, Mar 1991, 4



**Formaldehyde:** May 1985, 6; Dec 1985, 11; Dec 1986, 10; July 1988, 2; Mar 1989, 11; July 1989, 9; Sept 1989, 7; May 1990, 8; Sept 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; California revises source test method for, Mar 1991; as contributor to air toxics problem, Sept 1984, 2-3; EPA reports on, July 1984, 6; and New York's toxic air contaminant stack assessment program, Aug 1985, 7

**Freon 113:** May 1990, 8

**Fuel, waste-derived:** New Jersey rule on, Apr 1984, 2

**Furans:** See also Polychlorinated dibenzofurans (PCDFs), Tetrachlorodibenzofurans (TCDFs); and municipal waste combustor standard, Mar 1991, 8-9

**Gasoline marketing:** EPA proposes regulation of benzene from, Dec 1989, 11; EPA rulemaking on benzene emissions sources, Sept 1984, 9; PSAPCA estimates regulation effectiveness, Mar 1990, 6

**Gasoline vapors:** NESCAUM report on, Dec 1989, 6-8

**Genetic toxicants:** EPA risk assessment guidelines available on suspected, July 1988, 11; new system to evaluate introduced, July 1989, 8-9

**Geographic studies:** PIPQUIC developed for, July 1989, 4

**Georgia Environmental Protection Division:** and control of vegetation damage from toxic air pollutants, Feb 1985, 4

**Glass manufacturing plants:** as inorganic arsenic emissions sources, Sept 1984, 9

**Great Lakes Agreement:** Mar 1987, 2; Mar 1990, 7; and Indiana regulation, May 1990, 1; and Region V transboundary project, May 1989, 5-6

**Ground water:** and air toxics, Jan 1990, 1, 10; report on air strippers for, June 1987, 5

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**Halons:** Oregon reduces use of, Nov 1990, 7-8

**Hazard index, EPA's:** used in Chattanooga monitoring, Jan 1988, 6; used in Minnesota risk assessment, May 1989, 3-4; used in Rhode Island nuisance regulation, Jan 1991, 1-2

**Hazardous Air Pollutant Prioritization System (HAPPS):** Feb 1984, 5

**Hazardous air pollutants:** See Air pollutants, toxic

**Hazardous material:** air toxics from contaminated soil, Jan 1990, 1, 10; burning of for fuel, Apr 1984, 2; emergency planning guide prepared, Nov 1987, 10; and Oregon develops training program on, May 1990, 4, 9-10

**Hazardous organics:** May 1990, 9; EPA develops NESHAP, Sept 1987, 12; equipment leak standards complete, Mar 1991, 8

**Hazardous waste disposal:** California agency's enforcement of regulations, June 1987, 3; document on pathway analyses for, Nov 1988, 8; and EPA Six Months Study, Apr 1984, 4; Massachusetts air toxics provisions for, Jan 1989, 2; Oregon develops training program on, May 1990, 4, 9-10; Texas regulations on disposal of, Jan 1988, 3

**Hazardous waste treatment, storage and disposal facilities:** see Treatment, Storage, and Disposal Facilities (TSDF)

**Hazard Ranking System:** revised, July 1989, 7-8

**Health effects:** See also IRIS; as basis for chemical-specific air toxics guidelines, Dec 1983 (4-5); and California Air Resources Contaminant Identification and Control Process, Dec 1984, 4; and chemicals in the work place, Dec 1983 (6); covered in Massachusetts AALs, Jan 1990, 4; and EPA air toxics strategy, Aug 1985, 6; of gasoline exposure covered in NESCAUM study, Dec 1989, 6-8; and Massachusetts air toxics control program, Dec 1983 (7); noncancer, Sept 1988, 5-6, 8; and NESCAUM control policy guideline, Dec 1983 (6); OAQPS studies noncancer, Jan 1990, 9, 11; SARA Section 313 data base introduced, Sept 1988, 13-14; STAPPA/ALAPCO conducts survey of, Nov 1987, 10; STAPPA/ALAPCO finds need for information on, Dec 1989, 10; and radon emissions from uranium in soil, Mar 1986, 3; TACB develops biological test system to monitor, Jan 1988, 3; TACB to review for existing sources, May 1991, 1-2; and VOCs, Dec 1985, 3

**Health Effects Research Laboratory (HERL):** Jan 1988, 8, 10; develops method to assess toxics genetic activity, July 1988, 8-9

**Health risks:** California develops management levels for ethylene oxide rule, July 1990, 2; and cost, July 1984, 2-3; and dioxin, Apr 1984, 2-3; OAQPS initiates study of noncancer, Sept 1988, 5-6

**Hexachlorobenzene:** May 1990, 8

**Hexachlorocyclopentadiene:** May 1985, 6; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; regulatory status of under Clean Air Act, Dec 1985, 10

**Hexane:** Sept 1989, 3

**Hexane, n-:** verified RFC, Nov 1990, 2

**Home Evaluation Program (HEP):** Maine participation in, Mar 1989, 2

**Hospital sterilizers:** See also Ethylene oxide; EPA studies ethylene oxide in, May 1988, 9-10; new technology to control ethylene oxide use in, July 1988, 10

**Hospital waste incinerators:** see Incineration, hospital waste

**Hot spots:** CARB initiates information program on, July 1988, 5-6; CARB prepares regulation for, Mar 1990, 2, 3, 10; Nebraska performs dispersion modeling on, Sept 1989, 3; TACB sampling program for, May 1989, 3; treatment of toxic by CARB, Mar 1988, 5

**Houston:** monitoring program described, May 1988, 3-4

**Human Exposure Model (HEM):** Jan 1989, 8; July 1989, 8; May 1990, 2; updated as HEM II, May 1991, 3; used for High Risk Point Source study, May 1991, 9

**Hydrocarbons:** and IARC evaluation of wood smoke photo-oxidation products, June 1986, 5; NESCAUM adopts California automobile standard to reduce, Mar 1990, 3, 4

**Hydrochloric acid:** as product of resource recovery facilities, Mar 1986, 8-9

**Hydrogen chloride:** May 1989, 9; Air RISC studies short-term health effects of, Sept 1990, 10; California amends source test methods for, Mar 1991, 7-8; and hospital incinerators, Nov 1987, 5-6; listed as Extraordinarily Hazardous Substance in New Jersey, Sept 1986, 5; Maryland Consent Orders to reduce, Mar 1991, 5-6; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; Oklahoma limits biomedical waste incinerator emissions, May 1991, 4; verified RfC, Nov 1990, 2

**Hydrogen cyanide:** July 1990, 9; listed as Extraordinarily Hazardous Substance in New Jersey, Sept 1986, 5

**Hydrogen fluoride:** July 1990, 9; California amends source test method for, Mar 1991, 7-8; listed as Extraordinarily Hazardous Substance in New Jersey, Sept 1986, 5

**Hydrogen sulfide:** Jan 1989, 9; July 1990, 9; listed as Extraordinarily Hazardous Substance in New Jersey, Sept 1986, 5; delisted in proposed Clean Air Act, May 1990, 10; verified RfC, Nov 1990, 2

**Hydroquinone:** RfC non-verifiable, Nov 1990, 3

**Idaho:** examines sugar beet VOC emissions, May 1988, 4-5; sampling program in under IACP, Sept 1988, 11-12

**Incineration:** dioxin/furan testing for, Sept 1986, 8-9; OAQPS publishes report on sewage sludge, July 1990, 9; Ohio studies emissions from sewage sludge, May 1990, 5-6; and New York's toxic air contaminant stack

**Incineration (continued):** assessment program, Aug 1985, 7-8; and sewage sludge rule, Jan 1990, 7; solid waste disposal options discussed, Sept 1986, 10; used for contaminated soil in Florida, Jan 1990, 10

**Incineration at sea:** and hazardous wastes, Feb 1984, 6

**Incineration, biomedical waste:** Air RISC plans brochure for, May 1991, 10; Rhode Island nuisance regulation includes biomedical waste, Jan 1991, 1-2

**Incineration, hospital waste:** Nov 1987, 5-6; May 1989, 7; corrections to study issued, July 1990, 8; and CTC, Mar 1988, 9; EPA report on, Nov 1987, 5-6; Oklahoma sets performance criteria for, May 1991, 4, 7; required by California program to submit risk assessments, Dec 1986, 4; study on released, Jan 1989, 14; Wisconsin is requiring LAER contested, Nov 1990, 4-5; workshop on, Mar 1988, 11; workshop on, Mar 1988

**Indiana:** Spotlight on Department of Environmental Management, May 1990, 1, 8

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**Inhalation pathway:** July 1990, 7; cited in California rule on carcinogens, Mar 1989, 6

**Integrated Air Cancer Project (IACP):** airborne carcinogens project, Mar 1986, 7; Boise study described, May 1988, 4-5; description of, May 1985, 2-3; field studies conducted by, Dec 1985, 5-6; Idaho sampling program, Sept 1988, 11-12; and project to evaluate mutagenic activity of wood smoke photo-oxidation products, June 1986, 5-6; reports woodstove emissions measurements, Dec 1986, 9-10; Roanoke selected as study site, May 1988, 5-6; Roanoke air sampling complete, Jan 1990, 7-8; samples from identified by GC/MI-IR, Sept 1987, 13; studies mobile source VOC/PM link, May 1989, 5; studies wind flow and plume dispersion, Sept 1989, 5-6; study of mobile sources and wood smoke mutagenicity, Nov 1988, 3-4; and support from AEERL, Feb 1985, 2-3; woodstove emission study described, June 1987, 9

**Integrated Environmental Management Division (IEMD):** ambient monitoring program on chlorinated organics and aromatics, Apr 1984, 5-6

**Integrated Environmental Management Project (IEMP):** Jan 1989, 12; Maryland completes Phase I of, Sept 1987, 3

**Integrated Risk Information System (IRIS):** See IRIS

**Intent-to-list:** and EPA decisions on trichloroethylene and perchloroethylene, Mar 1986, 9; and Section 112, Clean Air Act, June 1986, 1; and STAPPA/ALAPCO conference on air toxics, Dec 1985, 8

**International Agency for Research on Cancer (IARC):** and list of carcinogens, Dec 1983 (6); list of hazardous air pollutants and carcinogens compiled by, Sept 1986, 3-4; used in Florida air toxics standards, Mar 1991, 4; uses HERL genetic toxicity studies, July 1988, 8-9

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**IRIS (Integrated Risk Information System):** Sept 1987, 14; May 1989, 8; available to public, July 1988, 10-11; described, Mar 1987, 8-9; eight RfCs available, Nov 1990, 3; files to be added for SARA Section 313 chemicals, July 1988, 11

**Kansas:** adopts air toxics strategy, Jan 1988, 6-7; asks Air RISC styrene question, Jan 1991, 5; uses Kansas Further Evaluation Level (KFEL), Jan 1988, 6-7

**Kentucky:** spotlight on air toxics program, May 1988, 2-3

**Kerosene heaters:** emissions from, Mar 1989, 9

**Landfills:** alternatives to, Aug 1985, 7-8; California agency's hazardous waste enforcement efforts at, June 1987, 3; excavation of and South Coast rule governing toxic emissions from, July 1984, 1-2; emissions from controlled in California, July 1990, 5-7; information on disposal

**Landfills (continued):** facilities sought, Sept 1987, 15; and odor in Staten Island/New Jersey, Sept 1990, 5; and NYDEC research recovery stack emissions assessment program, Sept 1986, 8

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**Leak detection and repair (LDAR):** used in equipment leak regulation, Jan 1990, 2-3

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**Louisiana:** asks Air RISC styrene question, Jan 1991, 5; implements toxics program, Dec 1989, 2-3; prepares VOC report, May 1989, 9; and special study identifying toxic air pollutants, Feb 1984, 6

**Lowest Achievable Emission Rate (LAER):** Sept 1988, 13; basis for NESCAUM top-down BACT, Jan 1989, 6; for carcinogens in Louisiana, Nov 1990, 4; and Kansas air toxics strategy, Jan 1988, 7

**Lowest Observed Adverse Effect Level (LOAEL):** Nov 1988, 5; how identified in Rhode Island air toxics regulation, Sept 1988, 2-3; and RfDs, July 1988, 6

**Lowest Observed Effects Level (LOEL):** Jan 1988, 5; Dec 1989, 8; used in noncancer risk assessment, Jan 1990, 9, 11

**MACT:** See Maximum Achievable Control Technology (MACT)

**Maine:** air toxics control program, Dec 1983 (7); and air toxics inventory, Sept 1984, 4; Bureau of Health conducts wood smoke assessment, Dec 1986, 7-8; spotlight on Maine Department of Human Services, Mar 1989, 2; State agency studies radon in air and groundwater, June 1987, 7-8

**Major sources:** see also Point sources; Stationary sources; Mar 1990, 5; defined by proposed revised Section 112, Sept 1989, 3-4

**Malathion:** RfC non-verifiable, Nov 1990, 3

**Maleic anhydride plants as benzene emissions source:** May 1985, 6; EPA rulemaking on, Sept 1984, 9; and California Air Resources Identification and Control Process, Dec 1984, 5; and CAA rulemaking on process vents, Feb 1984, 2

**Manganese:** May 1985, 6; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; and EPA report on locating and estimating emissions of, Dec 1985, 11; EPA draft source/emission factor report on, Dec 1984, 9; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; regulatory status of under Clean Air Act, Dec 1985, 10; verified RfC, Nov 1990, 2

**Maryland:** adopts comprehensive regulations for toxic air pollutants, Jan 1989, 10-12; assesses air toxics reductions, Mar 1991, 5-6; calls Air RISC on nickel risk assessment, Jan 1991, 5; industry prepared for MACT, Mar 1991, 5-6; joins air management association, May 1990, 2; SARA Title III data on industries in, Nov 1988, 6; spotlight on Department of the Environment, Sept 1987, 3-4; studies radon risk communication, Sept 1988, 6-7

**Massachusetts, Commonwealth of:** Sept 1984, 5; and air toxics control program, Dec 1983 (4-5, 7); promotes toxic use reduction, Sept 1990, 7-8; sets AALs for toxics, Jan 1990, 4; spotlight on air toxics monitoring, Jan 1989, 2-3

**Material safety data sheets (MSDS):** Jan 1989, 7

**Maximum Achievable Control Technology (MACT):** May 1990, 10; July 1990, 1, 8-9; defined under proposed Clean Air Act amendments, Mar 1990, 10, 11; required under Indiana regulation, May 1990, 8; Senate offer and, Sept 1990, 2; operating permits used to determine, May 1991, 1-2

**Maximum Individual Cancer Risk (MIR):** May 1990, 1

**Media relations:** used in incinerator dioxin testing program, Sept 1986, 8-9

**Medical, research, and training facilities:** as sources of radionuclide emissions, Dec 1984, 7

**Memorandum of Understanding (MOU):** and EPA prototype scheme for handling toxic air pollutants, Sept 1984, 3; and State/local option to evaluate acrylonitrile, Dec 1984, 9

**Mercuric chloride:** RfC non-verifiable, Nov 1990, 3

**Mercury:** May 1985, 6; Sept 1987, 9; Mar 1990, 7; May 1990, 8; July 1990, 7; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; Clean Air Act Amendments require municipal waste combustor standard for, Mar 1991, 8-9; and New York's toxic air

**Mercury (continued):** contaminant stack assessment program, Aug 1985, 7; Oklahoma limits biomedical waste incinerator emissions, May 1991, 4; as product of resource recovery facilities, Mar 1986, 8-9; verified RfC, Nov 1990, 2

**Metals:** California drafts source test method for multiple, Mar 1991, 7-8; emitted by resource recovery facilities, Mar 1986, 8-9

**Methane:** as emission from residential wood combustion devices, May 1985, 4-5

**Methyl bromide:** May 1985, 6; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5

**Methyl chloroform:** See also Trichloroethane, 1,1,1-; May 1985, 6; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; regulatory status of under Clean Air Act, Dec 1985, 10

**Methylene chloride:** May 1985, 6; Sept 1987, 12; Sept 1988, 3; Jan 1989, 7, 8; May 1989, 9; July 1989, 9; May 1990, 5-6, 8; July 1990, 7, 9; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; and EPA/IEMD ambient monitoring program, Apr 1984, 5-6; and Michigan's use of air stripping of VOCs, Dec 1985, 4; New York moves to reduce emissions of, Sept 1989, 4-5; regulatory status of under Clean Air Act, Dec 1985, 10; verified RfC, Nov 1990, 2

**Methyl ethyl ketone:** May 1990, 5

**Methyl isocyanate:** July 1990, 9; listed as Extraordinarily Hazardous Substance in New Jersey, Sept 1986, 5

**Michigan:** Feb 1984, 4; air toxics control program, Dec 1983 (4); asks Air RISC styrene question, Jan 1991, 5; Michigan Air Pollution Control Commission studies air stripping of volatile organic compounds, Dec 1985, 2-3; Wayne County establishes health-based toxics information system, May 1990, 6-7

**Mid-Atlantic Regional Air Management Association (MARAMA):** formed, May 1990, 2

**Mineral fibers:** California investigates source test method for, Mar 1991, 7-8

**Mining:** cyanide destruction and Alaska ammonia standard, Mar 1991, 1-2

**Minnesota:** Air RISC reviews risk assessment for, May 1989, 3-4

**Mississippi:** announces air toxics permit review program, Dec 1986, 5

**Mobile sources:** and air pollution/cancer report, Apr 1984, 6; Denver's inspection and maintenance program, Jan 1990, 11; and EPA Six Months Study, Apr 1984, 5; and emission of carcinogens from, May 1985, 2-3; and



**Mobile sources (continued):** IACP project identifying airborne carcinogens, Mar 1986, 7; and IACP field studies, Dec 1985, 5-6; IACP studies tracers for PM emissions from, May 1989, 5; mutagenicity of emissions of, Nov 1988, 3-4; new regulations for, Dec 1985, 8; Region VI includes in comparative risk, Sept 1990, 5

**Modacrylic fibers:** and EPA prototype scheme for handling, Sept 1984, 3

**Modeling:** California agency's use of in compiling emissions inventory, June 1987, 3; CTC/AEERL install new equipment for, Sept 1989, 9; examples of, Feb 1984, 4; ISCST used in Virginia regulation, Dec 1989, 4; of mobile source emissions, May 1989, 5; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; numerical, Apr 1984, 2; performed at incinerator, Sept 1986, 9; Puget Sound rule requires in impacts analysis, Nov 1990, 1; receptor and IACP project identifying airborne carcinogens, Mar 1986, 7; TACB predicts ambient impacts with, May 1991, 1-2; workshop on, Mar 1988, 11

**Modeling, exposure:** Human Exposure Model II released, May 1991, 3; indirect human exposures to municipal waste combustion, May 1991, 7-8; ORD develops blood lead distribution, May 1991, 3; used to detect halogenated solvents, Nov 1987, 7-8

**Monitoring, air toxics:** May 1988, 3-4; May 1989, 2-3; Sept 1990, 5; California agency's programs for ambient air, June 1987, 3; and Connecticut air toxics regulation, Sept 1986, 5; considerations of, Dec 1983 (6); EPA guidance on applying data quality objectives process, Dec 1989, 5; Houston program described, Mar 1988, 10; Indoor Air Source Emissions Data Base update, June 1986, 11; Louisiana uses to prepare VOC report, May 1989, 9; Massachusetts program for, Jan 1989, 2-3; program conducted by EPA, Apr 1984, 5; program for urban air toxics described, Sept 1987, 7; PSAPCA uses aerosol sampling protocol in, Dec 1989, 4; for RCRA VOC/risk assessment program, Sept 1987, 5-6; study of, Sept 1984, 2; used in study of emissions from chemical plant, Feb 1985, 4; and New Hampshire's air toxics control program, Dec 1983 (7); and New Jersey's air toxics control program, Dec 1983 (7-8); in Staten Island/New Jersey project, Sept 1990, 5-6; TACB programs to assess toxics, Jan 1988, 3; Title V program to require data, May 1991, 1-2; topic at STAPPA/ALAPCO conference, Dec 1984, 2; and Toxic Air Monitoring System (TAMS), May 1985, 7; used in Dayton, Ohio, PM network, Mar 1988, 8

**Monitoring, continuous emissions:** required for CO from Oklahoma biomedical waste incinerators, May 1991, 4

**Montreal Protocol on Substances that Deplete the Ozone Layer:** May 1989, 7; Nov 1990, 7

**Most Appropriate Occupational Level (MAOL):** and Massachusetts' air toxics control program, Sept 1984, 5; and NESCAUM regional air toxics strategy for perchloroethylene, Dec 1985, 6-7

**Multipathway analysis:** cited in California rule on carcinogens, Mar 1989, 6; Santa Barbara risk assessment models accommodates, Nov 1990, 8-9

**Multi-year development plan (MYDP):** and EPA air toxics strategy, June 1986, 8-9; and EPA urban air toxics programs, Sept 1987, 7; for Philadelphia, July 1989, 9; progress reviewed, Mar 1987, 11; summary of development, Sept 1987, 13-14

**Municipal waste combustion:** see Combustion, municipal waste

**Municipal waste disposal:** see Solid waste disposal

**Mutagens:** EPA risk assessment guidelines available on, July 1988, 11; and IACP evaluation of wood smoke photo-oxidation products, June 1986, 5-6; IACP study of, Nov 1988, 3-4

**NAAQS:** See National Ambient Air Quality Standards (NAAQS)

**NATICH:** See National Air Toxics Information Clearinghouse (NATICH)

**NATICH data base:** Aug 1985, 1-2; Mar 1986, 2-3; June 1986, 1-2; Nov 1987, 2; May 1989, 1-2; May 1990, 1, 3-4; July 1990, 3-6; agency contacts to trade releases under SARA, May 1988, 1-2; capabilities of, Mar 1986, 2; changes in programs and log on procedures, June 1987, 1-2; contents of, May 1985, 1-2; fees for use of, Dec 1985, 2; function of Newsletter in, Dec 1983 (2); final development plan for, Dec 1983 (2); how to access, Feb 1985, 1-2; inception of, Dec 1983 (1); information dissemination tools, Dec 1983 (2); material covered in, Dec 1985, 1; menu selections explained, July 1989, 1-2; new password procedures for, Sept 1989, 1-2; on-line data entry and editing systems initiated, Dec 1986, 1-2; permit records in, June 1986, 2; reasons for accessing on-line, Sept 1987, 1-2; risk analysis results incorporated into, Nov 1988, 1-2; security system for, Sept 1986, 1; State and local agency participation in, July 1988, 1; TRIS access through Dec 1989, 1-2; using passwords for, Mar 1989, 1; who can use, Dec 1985, 1

**NATICH reports:** Sept 1986, 2; carcinogen risk assessment is topic of, Mar 1987, 1; how to obtain, Dec 1985, 2; list of current, Sept 1987, 2; ordering procedures for, Mar 1986, 3; price list for, Nov 1987, 2; purposes of, Dec 1983 (1); recent distributions and prices, Sept 1989, 2; "report card" grade for, Dec 1989, 2; 1990 reports announced, Mar 1991, 3; risk communication report to be published, Mar 1988, 2; and State/local air agency needs, Dec 1983 (2); State/local air toxics agency activities, Dec 1984, 1; titles prepared for, Sept 1986, 1-2

**National Acid Precipitation Assessment Program (NAPAP):** Jan 1988, 3; issues report on anthropogenic emissions, May 1989, 9-10

**National Air Toxics Information Clearinghouse (NATICH):** announces working group members, Nov 1987, 1-2; charter adopted by Working Group, Dec 1983 (1-2); re-evaluated in light of Clean Air Act Amendments, Mar 1991, 3;

**National Air Toxics Information Clearinghouse (NATICH)** (continued): "report card" results described, Sept 1987, 1-2; staff duties highlighted, Jan 1989, 2; Working Group meets to review activities and plan future, Sept 1986, 1

**National Air Toxics Strategy:** Aug 1985, 3-5, 5-7; Dec 1985, 11; Dec 1986, 2; Jan 1989, 3-4; July 1989, 4; Mar 1990, 5

**National Ambient Air Quality Standards (NAAQS):** and NESCAUM automobile emission standards, Mar 1990, 3, 4; for lead used in sludge disposal rule, Jan 1990, 7; TSP and 1987 revision to, Jan 1989, 4-5; U.S. attainment of, Nov 1987, 4; used in Rhode Island nuisance evaluation, Jan 1991, 1-2

**National Contingency Plan, The:** June 1986, 3; and EPA air toxics strategy, Aug 1985, 5

**National Dioxin Strategy (EPA):** Apr 1984, 2-3

**National Emission Standards for Hazardous Air Pollutants (NESHAP):** Nov 1988, 9; Mar 1990, 5; approaches for benzene outlined, Sept 1988, 9-11; for beryllium used in sludge disposal rule, Jan 1990, 7; asbestos inspection program, Mar 1987, 10-11; enforcement and EPA air toxics strategy, Aug 1985, 3-5; enforcement of standards on asbestos in California, June 1987, 3; and EPA air toxics strategy, June 1986, 9; EPA report on, Sept 1984, 3; for hazardous air pollutants, Jan 1989, 4; hazardous organic NESHAP under development, Sept 1987, 12; proposed for commercial and hospital sterilizers, May 1988, 9-10

**National Emissions Data System (NEDS):** See also **Aerometric Information Retrieval System (AIRS)**; Jan 1989, 9; used in Chicago emissions inventory, Nov 1987, 6-7; used in draft source category list development, Mar 1991, 1-2; used by IACP, May 1988, 5-6

**National Governors' Association (NGA):** Jan 1988, 7-8

**National Institute for Occupational Safety and Health Recommended Exposure Limits (NIOSH RELs):** used in South Carolina air toxics limits, Jan 1991, 2-3

**National Response Team (NRT), The:** and EPA air toxics strategy, Aug 1985, 5; Regional Response Team, June 1986, 3

**National Toxicology Program (NTP):** carcinogens and hazardous air pollutants identified by, Sept 1986, 3-4; used in Florida air toxics standards, Mar 1991, 4

**Natural Resources Defense Council (NRDC):** analyzes Maryland SARA Title III data, Nov 1988, 6

**Nebraska:** spotlight on Nebraska Air Quality Division, Sept 1989, 2-3

**NESCAUM:** See Northeast States for Coordinated Air Use Management

**NESHAP:** See National Emission Standards for Hazardous Air Pollutants (NESHAP)

**New Hampshire:** air toxics control program, Dec 1983 (7)

**New Jersey:** July 1989, 6-7; air toxics control program, Dec 1983 (7-8); conducts joint air toxics study, Sept 1990, 5-6; EPA support activities of, July 1988, 8; joins air management association, May 1990, 2; passes first chemical accident prevention legislation, Sept 1986, 5-6; proposes rule to cover accidental releases, Mar 1988, 6-7; and waste oil as fuel regulation, Apr 1984, 2

**New Mexico:** defines BACT to be technology-based, Jan 1991, 3-4; sets air toxics regulations, Jan 1991, 3-4

**New Source Performance Standards (NSPS):** set for municipal waste combustors, Mar 1991, 8-9; for sewage sludge incineration, Jan 1990, 7

**New Source Review (NSR):** July 1988, 2; Mar 1990, 6; FLATWG improves procedure for, Mar 1991, 4; nonattainment permit requirements for, Jan 1989, 5; for North Carolina, Mar 1990, 2; Philadelphia air toxics program, July 1989, 9; Texas Air Control Board program, Jan 1988, 2-4

**New York:** air toxics control program, Dec 1983 (4, 8), Feb 1984, 4; conducts joint air toxics study, Sept 1990, 5-6; moves to reduce methylene chloride emissions, Sept 1989, 4-5; NYDEC's resource recovery stack emissions assessment program, Sept 1986, 7-8; NYSERDA conducts woodstove study, Dec 1986, 8; NYSERDA prepares report on woodstove emissions, Jan 1988, 11; prepares report on woodstove smoke emissions, Jan 1988, 11; studies radon risk communication, Sept 1988, 6-7; and toxic air contaminant stack assessment program, Aug 1985, 7-8

**NEWMOA:** See Northeast Waste Management Officials' Association

**Nickel:** May 1985, 6; Dec 1985, 11; July 1989, 10; May 1990, 5-6; Air RISC and Maryland risk assessment approach for, Jan 1991, 5; as contributor to air toxics problem, Sept 1984, 2-3; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; EPA reports on, July 1984, 6; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; Oklahoma limits biomedical waste incinerator emissions, May 1991, 4; regulatory status of under Clean Air Act, Dec 1985, 10

**Nickel refinery dust:** Maryland, Air RISC and risk assessment for, Jan 1991, 5

**Nitrile rubber:** and EPA prototype scheme for handling, Sept 1984, 3

**Nitrobenzene:** May 1985, 6; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; verified RfC, Nov 1990, 2

**Nitrosamines:** and Wisconsin's air toxics program, Sept 1986, 3

**Nitrosomorpholine:** May 1985, 6; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5

**Nitrogen oxides (NO<sub>x</sub>):** Jan 1988, 3; Sept 1990, 4; as emissions from residential wood combustion devices, May 1985, 4-5; and IACP evaluation of wood stove photo-oxidation products, June 1986, 5-6; levels in landfill gas incineration, July 1990, 6; controlled in municipal waste combustor standard, Mar 1991, 8-9; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; Oklahoma limits biomedical waste incinerator emissions, May 1991, 4; as product of resource recovery facilities, Mar 1986, 8-9; selective catalytic reduction and Alaska ammonia standard, Mar 1991, 1-2

**N-Nitrosodiphenylamine:** July 1989, 10

**Noncriteria pollutants:** See Air pollutants, toxic

**Nonmethane Organic Compounds Program (NMOC):** Sept 1990, 5

**No Observed Adverse Effect Level (NOAEL):** compared to new method to estimate noncancer risk, Jan 1990, 5-6; defined for Alaska ammonia standard, Mar 1991, 1-2; examined in California ethylene oxide rule, July 1990, 2; how identified in Rhode Island air toxics regulation, Sept 1988, 2-3; and RfDs, July 1988, 6

**No Observable Effects Level (NOEL):** Jan 1988, 5; Nov 1988, 5; used in regulating air toxics, Mar 1987, 4

**North Carolina:** Jan 1989, 9; adopts new air toxics regulations, Mar 1990, 1, 2; joins air management association, May 1990, 2; pollution prevention program in, Sept 1989, 6-7; reviews list of toxic air pollutants for regulation, Mar 1987, 4

**Northeast States for Coordinated Air Use Management (NESCAUM):** Jan 1988, 7; adopts BACT guideline, Jan 1989, 6-7; develops MWC test protocol with CTC, Mar 1988, 9; issues report on gasoline reports, Dec 1989, 6-8; and move to certify resource recovery facility operators, Mar 1986, 8-9; and noncriteria pollutant control policy guideline, Dec 1983 (6); perchloroethylene health evaluation document and, Sept 1986, 11; publishes newsletter, Nov 1987, 9; pursues California auto standards, Mar 1990, 3, 4; regional air toxics strategy for perchloroethylene, Dec 1985, 6-7; resource recovery workshop coordinated by, Sept 1986, 10; sponsors municipal waste combustion workshop, Mar 1987, 8; sponsors training course to prevent accidental releases, Mar 1987, 5; studies municipal waste combustion, June 1987, 5; and waste oil combustion presentation, Sept 1984, 8

**Northeast Waste Management Officials' Association (NEWMOA):** provides pollution prevention technical assistance, Nov 1990, 5

**NSPS:** See New Source Performance Standards (NSPS)

**Nuclear power reactors:** as sources of radionuclide emissions, Dec 1984, 7

**Occupational Safety and Health Administration Permissible Exposure Limits (OSHA PELs):** used in Florida air toxics standards, Mar 1991, 4; used in South Carolina air toxics standards, Jan 1991, 2-3

**Office of Air and Radiation (OAR):** and TSDF regulations, Apr 1984, 5; institutes air toxics control technology center, Dec 1986, 2-3

**Office of Air Quality Planning and Standards (OAQPS):** July 1988, 7-8; July 1989, 8; ambient monitoring program on chlorinated organics and aromatics, Apr 1984, 5-6; begins study of consumer products, Jan 1990, 8; compiles air toxics emission factors, Jan 1989, 14; conducts noncancer risk assessment, Jan 1990, 9; conducts screening study to monitor toxic air pollutants, Dec 1986, 10; cosponsors air toxics workshop, Dec 1986, 2; develops NSPS on residential wood fired combustion, May 1985, 3-5; documents air pathway analyses, Nov 1988, 8; establishes emission measurement center, Mar 1989, 7; evaluates noncancer health base, July 1989, 2; forms new emission factors and inventories branch, Jan 1991, 6; introduces bulletin board for models and test methods, Sept 1990, 10-11; issues directive on VOC control, Dec 1989, 9; issues documents on urban soup, cancer risk, Sept 1989, 10; issues reports on emissions estimates, urban air toxics, Sept 1989, 9-10; performs cancer risk assessment for incinerator, Sept 1986, 9; prepares standards for hazardous waste TSDF, July 1989, 9-10; produces wood smoke public service announcements, Nov 1990, 9; publishes air toxics program manual, Sept 1990, 9; publishes benzene report, May 1988, 10-11; publishes butadiene report, Jan 1990, 1; publishes comfort cooling tower standards, Sept 1990, 8-9; publishes sewage sludge incinerator report, July 1990, 9; publishes toxic air emission report, Mar 1990, 11; publishes urban air toxics report, Jan 1989, 14; releases air toxics data base, Sept 1990, 9; publishes PCBs, POM sources documents, Nov 1987, 8-9; releases natural dioxin study results, Nov 1987, 8; report on toxic air pollutants, sources, Jan 1988, 10-11; revises air pathway analysis guide, Jan 1991, 2; revises air speciation manual, Mar 1990, 9; sets municipal waste combustor standards, Mar 1991, 8-9; updates Human Exposure Model, May 1991, 3; uses "Reg Neg" to control equipment leaks, Jan 1990, 2-3; works with OTS on SARA 313 data, May 1988, 8

**Office of Emergency and Remedial Response (OERR):** issues directive on VOC Control, Dec 1989, 9

**Office of Health and Environmental Assessment (OHEA):** Jan 1988, 8

**Office of Mobile Sources (OMS):** Sept 1990, 5

**Office of Policy, Planning and Evaluation (OPPE):** develops PIPQUIC, July 1989, 4-6

**Office of Research and Development (ORD):** Center for Environmental Research Information introduces pollution board system, Mar 1991, 4-5; conducts indoor air pollution research, Mar 1991, 4-5; develops blood lead distribution model, May 1991, 8; institutes Air Toxics Control Technology Center, Dec 1986, 2-3; organization and air toxics responsibilities defined, Jan 1988, 8-10

**Office of Solid Waste (OSW):** and TSDf regulations, Apr 1984, 5

**Office of Solid Waste and Emergency Response (OSWER):** evaluates hazardous waste site air releases, July 1989, 8; and National Dioxin Strategy, Apr 1984, 3

**Office of Toxic Substances (OTS):** July 1988, 7-8; completes emissions inventories, Sept 1987, 11-12; computes SARA data quality audits, Sept 1990, 7; conducts Section 313 surveys, Jan 1989, 12-13; works with OAQPS on SARA 313 data, May 1988, 8

**Office of Water (OW):** Mar 1991, 10; and National Dioxin Strategy, Apr 1984, 3

**Ohio:** See also **Regional Air Pollution Control Agency (RAPCA)**; radon levels in dwellings measured, Sept 1986, 6-7; RAPCA compiles PM network data, Mar 1988, 7-8; RAPCA tests for radon in, Mar 1989, 3-4; spotlight on Air Quality Development Authority, Nov 1988, 2-3; spotlight on Division of Air Pollution Control, Mar 1987, 2; studies air toxics relation to Lake Erie pollution, Mar 1990, 7-8; studies emissions from sludge incinerators, May 1990, 5-6

**Oklahoma:** sets performance criteria for biomedical waste incinerators, May 1991, 4, 7

**Ontario, Canada:** initiates air toxics assessment, Mar 1988, 7

**Operation and maintenance conditions:** and California Air Resources Contaminant Identification and Control Process, Dec 1984, 4

**Oregon:** develops training program, May 1990, 4, 9-10; limits consumer use of CFCs, halons, Nov 1990, 7-8; ranks risk of wood combustion, July 1988, 2

**Organic compounds:** as emission from residential wood combustion devices, May 1985, 3-5; emission limits for proposed municipal waste combustion regulation, July 1990, 7; measured by Toxic Air Monitoring System (TAMS), Apr 1984, 7; as products of resource recovery facilities, Mar 1986, 8-9; regulatory status of under Clean Air Act, Dec 1985, 10

**Organic gases, toxic:** audit cylinders for, Aug 1985, 8

**Ozone (O<sub>3</sub>):** Sept 1990, 4; attainment policy for, Nov 1987, 4-5; control of air strippers in nonattainment areas, Dec 1989, 9; and EPA air toxics strategy, Aug 1985, 3; and enhancement of air toxics program, Jan 1989, 5; and IACP evaluation of wood stove photo-oxidation products,

**Ozone ( $O_3$ ) (continued):** June 1986, 5-6; link to CFCs studied, May 1989, 7-8; and NESCAUM automobile emission standards, Mar 1990, 3, 4; Oregon limits CFCs, halon use to address depletion of, Nov 1990, 7-8

**PAH:** See Polycyclic aromatic hydrocarbon

**Paint spraying:** Air RISC reviews risk assessment of, May 1989, 3-4

**Particulate matter (PM):** Dec 1986, 8; Nov 1987, 6; Nov 1988, 9; Jan 1989, 4; Jan 1990, 10; Mar 1990, 9; July 1990, 7; Sept 1990, 4; and Colorado laws governing restaurants and street sanding, June 1986, 8; and Harvard School of Public Health project, May 1985, 7; and IACP project identifying airborne carcinogens, Mar 1986, 7; in indoor air and uranium decay, Mar 1986, 3; limited by wood heater NSPS, Dec 1986, 7; measured in IACP study, Nov 1988, 3-4; and municipal waste combustor metals standard, Mar 1991, 8-9; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; Oklahoma limits biomedical waste incinerator emissions, May 1991, 4; Ohio agency compiles network data on, Mar 1988, 7-8; relation to fuel switching in "Brown Cloud" study, Jan 1990, 2, 11; from residential wood combustion (OAQPS development of RWC NSPS to control), May 1985, 3-5; sampling of in Alaska, Nov 1987, 3-4; TSDF report covers emissions of, Dec 1986, 11; Vermont regulates air toxics under, July 1989, 3-4; VOCs as tracers of, May 1989, 5

**Particulate matter speciation:** EPA/OAQPS report on, Nov 1987, 9; species manual available, Nov 1988, 9-10

**PCBs:** See Polychlorinated biphenyls

**PCDDs:** See Polychlorinated dibenzodioxins

**PCDFs:** See Polychlorinated dibenzofurans

**Pennsylvania:** local agency regulation to control waste-derived liquid fuels, Dec 1986, 3; Allegheny County and State join air management association, May 1990, 2

**Pentachlorophenol (PCP):** emission information requested, Apr 1984, 8

**Perchloroethylene:** May 1985, 6; Sept 1987, 12; Sept 1988, 3; July 1989, 9; Sept 1989, 9; May 1990, 8; AEERL studies indoor air sources of, Mar 1991, 4-5; as contributor to air toxics problem, Sept 1984, 2-3; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; EPA decision on, Mar 1986, 9; and EPA/IEMD ambient monitoring program, Apr 1984, 5-6; NESCAUM health document on, Sept 1986, 11; and NESCAUM regional strategy to control, Dec 1985, 6-7; regulated by Florida dry cleaning facility regulation, Mar 1987, 3; regulatory status of under Clean Air Act, Dec 1985, 10

**Permissible Exposure Limits (PELs):** developed by California for air toxics rule, Mar 1988, 3



**Permits, building:** and Aspen, Colorado, regulation on woodburning, June 1986, 8

**Permits, operating:** Title V program for described, May 1991, 1-2

**Permitting:** California proposed rule on, June 1987, 2-3; California rule covers carcinogens and, Mar 1989, 5-7; CAPCOA source assessment manual designed to assist, Dec 1986, 4-5; for chemical company emitting cobalt oxide, Jan 1988, 4-6; and Connecticut's air toxics control regulation, Sept 1986, 4-5; and CTC, Mar 1988, 9; CTC/NJDEP develop software for, May 1988, 8; Florida couples air review with contaminated soil, Jan 1990, 1, 10; Houston monitoring program and, May 1988, 3-4; and Indiana's air toxics program, May 1990, 8; information in NATICH data base, July 1989, 1; Maryland process described, Sept 1987, 3-4; and Monterey Bay (CA) agency rule, Mar 1988, 2; new Mississippi program on, Dec 1986, 5; Nebraska regulations on, Sept 1989, 2-3; NESCAUM adopts BACT guideline to promote consistency in, Jan 1989, 6-7; and New York/Michigan's air toxics control programs, Feb 1984, 4; report on agency fees for, June 1987, 11; requirements under new North Carolina air regulations, Mar 1990, 2; Rhode Island air toxics regulation and, Sept 1988, 3; TACB policies on, Jan 1988, 2-3; workshop on, Mar 1988, 11

**Pesticides:** May 1989, 6; Sept 1989, 7; CTC/Florida evaluate emissions from burning of plastic containers for, Sept 1988, 4; dioxin contamination of, Apr 1984, 3; TACB establishes monitoring network for, May 1989, 2-3

**Petroleum refineries:** benzene fugitive emissions from, Feb 1984, 2

**Pharmaceuticals manufacturing:** EPA proposes regulation of benzene from, Dec 1989, 9; and odor in Staten Island/New Jersey, Sept 1990, 5

**Phenol:** May 1985, 6; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; regulatory status of under Clean Air Act, Dec 1985, 10; RfC non-verifiable, Nov 1990, 3

**Philadelphia, City of:** July 1989, 8-9; air toxics control program, Dec 1983 (4); testing for dioxins at incinerator, Sept 1986, 8-9; joins air management association, May 1990, 2

**Phosgene:** May 1985, 6; Sept 1988, 4; July 1990, 9; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; EPA report on locating and estimating emissions of, Dec 1985, 11; EPA draft source/emission factor report on, Dec 1984, 9; listed as Extraordinarily Hazardous Substance in New Jersey, Sept 1986, 5; RfC non-verifiable, Nov 1990, 3

**Phosphorus plants, elemental:** as sources of radionuclide emissions, Dec 1984, 7

**Phosphorus trichloride:** listed as Extraordinarily Hazardous Substance in New Jersey, Sept 1986, 5

**Point sources:** see also Major sources; Stationary sources; Jan 1989, 4; and cancer risk, Jan 1989, 4; Chattanooga-Hamilton County studies high risk, May 1991, 8-9; data base cross-references with toxic air pollutants, Sept 1990, 9; OAQPS document on estimating emissions from, Sept 1989, 9-10; OAQPS publishes emission report on, Mar 1990, 11; programs for high risk, May 1989, 3; RAPCA emission inventory of, Jan 1989, 7-8; and STAPPA/ALAPCO policy on hazardous air pollutants, Feb 1985, 4-5

**Pollution prevention:** Massachusetts offers technical assistance on, Sept 1990, 8; and Massachusetts survey of toxics use, Sept 1990, 8; and Massachusetts Toxic Use Reduction Act, Sept 1990, 7-8; NEWMOA provides technical assistance, Nov 1990, 5; North Carolina program described, Sept 1989, 6-7

**Polychlorinated biphenyls (PCBs):** May 1985, 6; Mar 1990, 8; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; EPA/OAQPS reports on, Nov 1987, 8-9; excluded in past from sludge incineration rule, Jan 1990, 7; and New York's toxic air contaminant stack assessment program, Aug 1985, 7

**Polychlorinated dibenzodioxins (PCDDs):** See also Dioxins, Tetrachlorodibenzo-p-dioxins (TCDDs); May 1985, 6; Sept 1987, 8; Mar 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; and New York resource recovery stack emissions assessment program, Sept 1986, 7-8; and New York's toxic air contaminant stack assessment program, Aug 1985, 7

**Polychlorinated dibenzofurans (PCDFs):** See also furans, tetrachlorodibenzofurans (TCDFs); Mar 1990, 8

**Polycyclic aromatic hydrocarbon (PAH):** May 1985, 6; Sept 1987, 9; Dec 1989, 3; Mar 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; covered in Ontario air toxics assessment, Mar 1988, 7; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; possible control under Indiana regulation, May 1990, 8; ratio of studied in woodstove tracers, June 1987, 9-10; use of in GC/MI-R, Sept 1987, 13

**Polycyclic organic matter (POM):** Dec 1986, 8; Jan 1989, 4; Mar 1989, 11; EPA/OAQPS reports on, Nov 1987, 8-9; and wood heater NSPS, Dec 1986, 7; and IACP woodstove emission measurement, Dec 1986, 9-10

**Polyester resin manufacturing:** Nov 1990, 1

**Power plants:** Rhode Island nuisance regulation includes, Jan 1991, 1-2

**Power plants, coal-fired:** all major air toxics sources in New Mexico, Jan 1991, 3-4

**Prevention of Significant Deterioration (PSD):** Jan 1989, 5; permit remand in California, Mar 1987, 11

**Prioritization:** California Air Resources Board use of for potential toxic air contaminants, May 1985, 6; and drafting carcinogen policy, Dec 1983 (6); and New York air toxics control program, Dec 1983 (8); and toxic air pollutants, Feb 1984, 5

**Program Integration Project Queries Using Interactive Commands (PIPQUIC):** described, July 1989, 4-6

**Propanol, 2-:** and Michigan's use of air stripping of VOCs, Dec 1985, 4

**Propylene:** and IARC evaluation of wood smoke photo-oxidation products, June 1986, 5

**Propylene dichloride:** July 1989, 9

**Propylene glycol monomethyl ether:** verified RfC, Nov 1990, 2

**Propylene oxide:** May 1985, 6; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; verified RfC, Nov 1990, 2

**Publicly Owned Treatment Works (POTW):** Sept 1990, 7; as contributor to air toxics problem, Sept 1984, 2; and sludge disposal rule, Jan 1990, 7

**Puget Sound Air Pollution Control Agency (PSAPCA):** asbestos regulation adopted by, Mar 1986, 8; evaluates air toxics program, Mar 1990, 6-7; regulates air toxics, Nov 1990, 1; spotlight on, July 1988, 2-4; urban air toxics study described, June 1987, 7; and waste-derived fuel regulation, Dec 1985, 4-5

**Pyridine:** May 1990, 8

**Quinone:** RfC non-verifiable, Nov 1990, 3

**RACT:** See Reasonably Available Control Technology (RACT)

**Radiation:** monitoring at Oklahoma biomedical waste incinerators required for, May 1991, 4, 7

**Radionuclides:** May 1985, 6; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; and withdrawal of EPA proposed standards for, Dec 1984, 7-8

**Radium facility wastes:** and radon emissions from, Mar 1986, 3

**Radon:** Sept 1989, 7; Sept 1990, 4; and indoor air, Mar 1986, 3-5; Maine survey on, Mar 1989, 2; measured in Ohio, Sept 1986, 6-7; and proposed standards on radionuclides, Dec 1984, 8; RAPCA tests for in schools, Mar 1989, 3-4; RAPCA's study results described, Mar 1987, 6-8; requirements of Superfund provisions on, Mar 1989, 8; risk communication programs for, Sept 1988, 6-7; studied in Maine, June 1987, 7-8

**Reasonably Available Control Technology (RACT):** Sept 1988, 13; Jan 1989, 5; specified in Kentucky regulation, May 1988, 3; used in PM control at chemical manufacturer in Tennessee, Jan 1988, 4

**Reference doses, (RfC) inhalation:** See also **IRIS, Reference doses, (RfD) inhalation;** 39 finalized, Nov 1990, 1; used in Rhode Island nuisance regulation, Jan 1991, 1-2

**Reference doses, (RfD) inhalation:** See also **IRIS, Reference doses, (RfC) inhalation;** Jan 1988, 5; defined by OHEA, July 1988, 6-7; methodology developed for, July 1988, 6-7

**Reference doses, (RfD) oral:** See also **IRIS;** July 1988, 6; methodology explained, May 1989, 8-9; used in Rhode Island nuisance regulation, Jan 1991, 1-2

**Reference matrix isolation infrared spectral library:** Sept 1987, 13

**Refineries:** and odor in Staten Island/New Jersey, Sept 1990, 5; are major air toxics sources in New Mexico, Jan 1991, 3-4; wastes from, July 1984, 2

**Region II:** conducts joint air toxics study, Sept 1990, 5-6

**Region III:** conducts dioxin/furan incinerator testing, Sept 1986, 8-9

**Region IV:** sponsors air toxics management workshop, Feb 1984, 3-5

**Region V:** conducts air toxics inventory (Chicago), Mar 1987, 6-7

**Region VI:** accidental release program, June 1986, 4-5; participates in EPA comparative risk project, Sept 1990, 4-5; sponsors air toxics workshop, Feb 1984, 5-6

**Region IX:** develops noncancer risk assessment, Jan 1990, 5-6

**Region X:** completes VOC risk assessment, Sept 1987, 5-6; organizes retreats for air toxics coordinators, Jan 1990,

**Regional Air Pollution Control Agency (RAPCA):** compiles PM network data, Mar 1988, 7-8; completes point source emission inventory, Jan 1989, 7-8; describes indoor air program, Sept 1989, 7-8; measures Ohio radon levels, Sept 1986, 6-7; results of radon study described, Mar 1987, 6-8; tests for radon in schools, Mar 1989, 3-4; toxic emissions data base described, June 1987, 10

**Regional Coordinators:** role of, May 1988, 7

**Regional deposited dose ratios (RDDRs):** function in RfD derivation, July 1988, 7

**Regional Response Team (RRT):** and EPA air toxics strategy, Aug 1985, 5

**"Reg Neg":** for equipment leaks complete, Mar 1991, 8; used to draft regulations on equipment leaks, Jan 1990, 2-3; used to draft wood heater NSPS, Dec 1986, 7

**Remediation, soil:** Florida guidelines for, Jan 1990, 1, 10

**Removal efficiency:** and air stripping of VOCs, Dec 1985, 3

**Reproductive Effects Assessment Group (REAG):** Jan 1988, 9

**Residential Wood Combustion (RWC):** See Combustion, residential wood-fired

**Resource Conservation and Recovery Act (RCRA):** July 1989, 8; Sept 1990, 4; authority for development of standards for hazardous waste TSDF, July 1989, 9-10; and Chicago emissions inventory, Mar 1987, 7; facilities assessment completed in Idaho, Sept 1987, 5-6; and TSDF regulations, Apr 1984, 5

**Resource recovery facility:** certification of operators of, Mar 1986, 8-9; facilities required by California program to submit risk assessments, Dec 1986, 4; NESCAUM coordinates workshop on, Sept 1986, 10; New York program on stack emissions, Sept 1986, 7-8; and New York's toxic air contaminant stack assessment program, Aug 1985, 7-8; Rhode Island nuisance regulation requires risk assessment for, Jan 1991, 1-2

**Resource Recovery Facility Emission Characterization (RRFECS):** See New York

**Rhode Island:** amends nuisance regulation, Jan 1991, 1-2; program to monitor solvents in ambient air, Mar 1987, 5-6; spotlight on Division of Air and Hazardous Materials, Sept 1988, 2-4

**Right-to-know amendments:** and Chemical Emergency Preparedness Program (CEPP), June 1986, 4; and Superfund, Dec 1985, 9; and workers with respect to chemical health effects, Dec 1983 (6)

**Risk assessment:** See also IRIS; May 1988, 5; May 1989, 6; Dec 1989, 5; Sept 1990, 5; and air toxics, Feb 1984, 2; Air RISC Workshop on, July 1989, 11; and Clean Air Act, Dec 1983 (5); conducted for MWCs, Sept 1987, 9; conducted in urban air toxics programs, Sept 1987, 7; document for carcinogens available, Jan 1990, 9; and equipment leak emissions, Jan 1990, 2-3; ECAO guide includes indirect exposures in, May 1991, 7-8; EPA's integrated risk information system described, Mar 1987, 8-9; EPA forum on, Nov 1988, 7-8; EPA guidelines available on, July 1988, 11; EPA introduces Air RISC, July 1988, 4-5; EPA Region X study described, Sept 1987, 5-6; five basic concepts of, Feb 1984, 4; for gasoline vapors conducted by NESCAUM, Dec 1989, 6-8; glossary and directory published, Sept 1989, 10; HEM II available for, May 1991, 3; HERL study of process needs, Jan 1988, 10; improvements in methods called for, Jan 1988, 7-8; IRIS data base information on, Sept 1987, 14; Maryland, Air RISC, and nickel, Jan 1991, 5; and NATICH data base, June 1986, 1-2; NATICH report on carcinogens, Mar 1987, 1; and NESCAUM

**Risk assessment (continued):** regional strategy to control perchloroethylene, Dec 1985, 6-7; of paint spraying facility, May 1989, 3-4; for point sources in NATICH, Nov 1988, 1-2; Region VI compares for 22 emission control problems, Sept 1990, 4-5; reproductive assessment guidelines for, Nov 1988, 10; requested in incinerator testing, Sept 1986, 9; required under new Clean Air Act, July 1990, 1; required under Senate version of proposed Clean Air Act Amendments, May 1990, 11; role of in benzene rulemaking, Feb 1984, 3; and risk management, Dec 1983 (5-6); role in California permit denial, Mar 1989, 5; topic at STAPPA/ALAPCO conference, Dec 1984, 2; and toxic cleanups Mar 1986, 6; and "two-step" benzene NESHAP process, Sept 1988, 9-10; for urban soup developed under PIPQUIC, July 1989, 4-6; (carcinogen) used by work group in examining solvent exposure, Nov 1987, 7; and waste oil handling and disposal, Feb 1984, 5; workshop on, Mar 1989, 5

**Risk assessment, noncancer:** developed in California, Jan 1990, 6; OAQPS conducts, Jan 1990, 9

**Risk assessment, use by States:** as basis for Connecticut toxic air pollutant regulation, Sept 1986, 4; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 4-5; conducted in Chicago for urban cancer, Mar 1989, 10-11; Maine conducts assessment of wood smoke, Dec 1986, 8; Maryland, Air RISC, and nickel, Jan 1991, 5; new California program requires, July 1988, 5-6; New Jersey applies to carcinogens, July 1989, 6-7; relation to air toxics programs stressed by California agency, Dec 1986, 4; role in California permit denial, Mar 1989, 5; Santa Barbara develops model, Nov 1990, 8-9; used in New Jersey chemical accident prevention legislation, Sept 1986, 5; used in North Carolina regulation, Mar 1987, 4; used in Ohio sampling study, Nov 1988, 2-3; used in Rhode Island nuisance regulation, Jan 1991, 5

**Risk communication:** Air RISC distributes publications on, Mar 1991, 6-7; Air RISC helps agencies improve, Sept 1990, 10; EPA program on described, June 1987, 5-6; hotline for, Nov 1987, 10; NATICH report on planned, Mar 1988, 2; for small risks under SARA Title III, Mar 1990, 1, 8-9

**Risk management:** and air toxics, Feb 1984, 2; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 4-5; EPA's integrated risk information system (IRIS) described, Mar 1987, 8-9; EPA, State agencies improve for radon, Sept 1988, 6-7; IRIS data base information on, Sept 1987, 14; levels of and Santa Barbara risk assessment model, Nov 1990, 8-9; and Maryland's proposed air toxics regulations, Sept 1987, 3-4; and New Jersey chemical accident prevention rule, Mar 1988, 6-7; New Jersey program separates from risk assessment, July 1989, 7; and risk assessment, Feb 1984, 2; topic at STAPPA/ALAPCO conference, Dec 1984, 2; used in New Jersey to prevent chemical accidents, Sept 1986, 5; workshop on, Mar 1989, 5

**Risk, Negligible:** defined under proposed Clean Air Act Amendments, May 1990, 11; Senate offer and, Sept 1990, 3

**Risk, Residual:** defined under proposed Clean Air Act Amendments, May 1990, 11; Senate offer and, Sept 1990, 2

**ROADMAPS:** introduced, Sept 1988, 13

**Roanoke:** selected as IACP study site, May 1988, 5-6

**Sampling, soil:** EPA/ESED report on TSDF covers, Dec 1986, 11

**Santa Barbara APCD:** develops risk assessment model, Nov 1990, 8-9; writes new ethylene oxide rule, July 1990, 2-3

**SARA Title III:** See Superfund Amendments and Reauthorization Act

**Science review panel:** and drafting carcinogen policy, Dec 1983 (6)

**Selenium:** May 1990, 5,6

**Sewage sludge:** May 1991, 7; OAQPS publishes report on, July 1990, 9; Ohio studies incineration emissions, May 1990, 5-6; Rhode Island nuisance regulation includes incineration of, Jan 1991, 1-2

**Sewage treatment plants:** and Alaska ammonia standard, Mar 1991, 1-2; and EPA Six Month Study, Apr 1984, 5; and odor in Staten Island/New Jersey, Sept 1990, 5; sludge disposal regulations, Jan 1990, 7

**Sick building syndrome:** Sept 1989, 7

**Silica, crystalline:** California investigates source test method for, Mar 1991, 7-8

**Site investigation:** and toxic cleanups, Mar 1986, 6

**Six Month Study, EPA:** See also National Air Toxics Strategy; Apr 1985, 3-5, 5-7; Aug 1985, 3-5; Dec 1985, 11; Nov 1988, 9; Jan 1989, 7; and Agency's air toxics strategy, Apr 1984, 4-5; update issued, May 1989, 10

**Sludge Regulation and Management Branch:** regulates sewage sludge disposal, Jan 1990, 7

**Smelters, copper:** are major air toxics source in New Mexico, Jan 1991, 3-4

**Solid waste:** Texas regulations on disposal of, Jan 1988, 3

**Solid waste disposal:** EPA plans regulation of, Sept 1987, 8-9; and EPA Six Months Study, Apr 1984, 4; NESCAUM sponsors workshop on, Mar 1987, 8

**Solvents:** Nebraska regulations to limit emissions, Sept 1989, 3; new technology avoids in cleaning printing equipment, May 1989, 7; recycling emissions controlled by national standards, July 1989, 9-10; Rhode Island program to monitor ambient levels of, Mar 1987, 5-6

**Source assessment:** CAPCOA publishes manual on, Dec 1986, 4; research needs in outlined, Jan 1988, 7-8

**Source categories:** draft list developed under Clean Air Act Amendments, Mar 1991, 1-2; to be listed under proposed Clean Air Act Amendments, May 1990, 10

**Source Evaluation Society:** Jan 1991, 7

**Source, Major:** See Major Sources

**Source sampling methods:** See also Emissions testing; California amends select, Mar 1991, 7-8; California regulation allows sharing data for, Mar 1990, 3; discussed at Region VI workshop, Feb 1984, 6

**South Carolina:** county agency community awareness and emergency response program, Sept 1987, 5; regulates air toxics, Jan 1991, 2-3

**South Coast Air Quality Management District (SCAQMD):** controls landfill gas emissions, July 1990, 5-7; establishes rule covering permits, carcinogens, Mar 1989, 5-7; and rule governing toxic emissions from landfills, July 1984, 1-2; spotlight on, June 1987, 2-3

**South Dakota:** spotlight on Department of Water and Natural Resources, Nov 1987, 3

**Speciation factors:** manual on, Nov 1988, 9-10; OAQPS releases data base for VOC and PM, Jan 1991, 6; OAQPS revises manual on, Mar 1990, 9, 10

**Stack sampling:** See also Emissions testing; emissions from chemical plant studied, Feb 1985, 4; New York resource recovery operation program, Sept 1986, 7-8; New York's toxic air contaminant assessment program on, Aug 1985, 7-8; performed at city incinerator, Sept 1986, 9; and resource recovery facilities, Mar 1986, 8-9; used in Connecticut air toxics regulation, Sept 1986, 5

**STAPPA:** See State and Territorial Air Pollution Program Administrators

**State and Territorial Air Pollution Program Administrators (STAPPA)/Association of Local Air Pollution Control Officials (ALAPCO):** July 1984, 6; Sept 1984, 8; Dec 1984, 2-3; and appointment of air toxics policy work group, Feb 1984, 6; comments on proposed municipal waste combustion regulations, July 1990, 7; conducts noncancer survey, Nov 1987, 10; conference on air toxics control, Sept 1986, 10; and EPA air toxics strategy, Aug 1985, 3-5; conferences of, Dec 1983 (3-4); coordinates SARA Section 313 data collection, July 1988, 7; members of NATICH working group meet, Sept 1986, 1; and NATICH, Dec 1983 (1); and NATICH data base, Dec 1985, 1-2; national air toxics workshops sponsored by, June 1987, 8; and policy on hazardous air pollutants, Feb 1985, 4-5; prepares report on air permit and emissions fees, June 1987, 11; and EPA Six Months Study, Apr 1984, 5-6; releases survey results for State and



**State and Territorial Air Pollution Program Administrators (STAPPA)/Association of Local Air Pollution Control Officials (ALAPCO) (continued):** local agencies, Dec 1989, 10; sponsors urban air toxics workshops, Mar 1989, 9-10; survey of toxic air pollutants, Feb 1984, 6; updates toxic air pollutant report, Nov 1988, 9

**State Implementation Plan (SIP):** and co-control of air pollutants, Jan 1989, 4-6; and EPA's national air toxics strategy, Nov 1987, 4; Title V permit to include requirements under, May 1991, 1-2

**State/local air toxics control agencies:** July 1984, 2, 4; Dec 1985, 8; technical assistance for, Dec 1984, 2; partnership with Federal agencies, Aug 1985, 3-4; use TRI data, Jan 1990, 4-5

**Stationary sources:** see also Point sources; Major sources; Sept 1987, 8; and Air Pollution/Cancer report, Apr 1984, 6; audit cylinders available for, Aug 1985, 8; California rules to reduce cancer risk from, Mar 1989, 6; PM emissions from woodstoves limited by NSPS, Dec 1986, 7; subject to Title V operating permits program, May 1991, 1-2; VOC emissions at hazardous waste TSDF, July 1989, 10

**Steel plants, emissions from:** Air RISC publishes health effects summary for, Nov 1990, 9; CTC report on, Dec 1989, 6

**Sterilizers, hospital and commercial:** control of ethylene oxide proposed, May 1988, 9-10; emissions from considered in California exposure assessment, July 1990, 2, 3

**Styrene:** May 1990, 8; May 1991, 9; Air RISC receives carcinogenicity question, Jan 1991, 5; and EPA prototype scheme for handling, Sept 1984, 3

**Styrene-butadiene:** Jan 1989, 4

**Styrene-butadiene rubber manufacturing:** High Risk Point Source study for, May 1991, 8-9; Oklahoma limits biomedical waste incinerator emissions, May 1991, 4, 7

**Substitute compounds:** and California Air Resources Contaminant Identification and Control Process, Dec 1984, 4

**Sugar beet processing:** VOC emissions from, May 1988, 4-5

**Sulfur dioxide (SO<sub>2</sub>):** Jan 1988, 3; Sept 1990, 4; and municipal waste combustor standards, Mar 1991, 8-9; and New York's toxic air contaminant stack assessment program, Aug 1985, 7; Oklahoma limits biomedical waste incinerator emissions, May 1991, 4; as refinery waste site contaminant, July 1984, 2; as product of resource recovery facilities, Mar 1986, 8-9

**Sulfur oxides (SO<sub>x</sub>):** as emissions from residential wood combustion devices, May 1985, 4-5

**Sulfur trioxide (SO<sub>3</sub>):** July 1990, 9

**Superfund Amendments and Reauthorization Act (SARA) Title III:** July 1989, 7; May 1990, 3-4; Mar 1990, 10; Jan 1991, 3; communicating small risk under, Mar 1990, 1, 8-9; and community right-to-know amendment, Dec 1985, 9; data available through NATICH/TRIS link, Dec 1989, 1-2; data from Maryland industries, Nov 1988, 6; data quality audits complete, Sept 1990, 7; data used in Louisiana regulation, Dec 1989, 3; directory for data base established (ROADMAPS), Sept 1988, 13-14; and equipment leak emissions, Jan 1990, 2-3; emissions from Superfund sites, May 1988, 7; and EPA air toxics strategy, Aug 1985, 6-7; EPA coordinates Section 313 activities, July 1988, 7-8; establishes toxic release data base, Nov 1988, 6-7; and EPA Six Months Study, Apr 1984, 4; hazardous substances at Superfund sites must be listed under, July 1989, 10; IRIS data to include information on, chemicals listed by, July 1988, 11; listed chemicals and Florida air toxics standards, Mar 1991, 4; and Massachusetts Toxics Use Reduction Act, Sept 1990, 8; OAQPS/OTS Section 313 plan for data, May 1988, 7-8; one industry states goals under, Sept 1988, 13; Section 313 OTS concludes QA pilot surveys under, Jan 1989, 12-13; reporting requirements, Sept 1987, 11-12; requirements of, Dec 1986, 5-6; requirements for radon, Mar 1989, 8; requires revisions to Hazard Ranking System, July 1989, 7-8; STAPPA/ALAPCO survey assesses effect of, Dec 1989, 10; Title III workshops conducted on, June 1987, 11; Toxic Release Inventory developed for, May 1988, 1-2

**Superfund sites:** See also **Superfund Amendments and Reauthorization Act (SARA) Title III**; emissions studied, May 1988, 6-7; EPA issues directive on air stripper use at, Dec 1989, 9; hazard ranking system, July 1989, 7-8

**Support Center for Regulatory Air Models (SCRAM):** and OAQPS bulletin board, Sept 1990, 10-11

**Surface coating:** Nebraska regulation to limit emissions, Sept 1989, 3

**Surface Impoundment Modeling System (SIMS):** introduced by CTC, Dec 1989, 5-6

**Systems Applications Human Exposure and Dosage (SHED):** Feb 1984, 4

**Systems Applications Human Exposure and Risk (SHEAR):** Feb 1984, 4

**T-BACT:** See BACT

**Tennessee:** See Chattanooga-Hamilton County APCB

**Teratogens:** See Genetic toxicants

**Tetrachlorodibenzofurans (TCDFs):** Oklahoma limits biomedical waste incinerator emissions, May 1991, 4, 7

**Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (2,3,7,8-TCDD):** Sept 1986, 8; May 1990, 8; in city incinerator ESP, Sept 1986, 8; and dioxin combustion source study, July 1984, 7; and New York's toxic air contaminant stack assessment program, Aug 1985, 8; Oklahoma limits biomedical waste incinerator emissions, May 1991, 4, 7

**Tetrachlorodibenzo-p-dioxins (TCDDs):** Oklahoma limits biomedical waste incinerator emissions, May 1991, 4, 7

**Tetrachloroethane, 1,1,2,2-:** July 1989, 7; and Michigan's use of air stripping of VOCs, Dec 1985, 4

**Tetrachloroethylene:** July 1989, 7; May 1990, 5; July 1990, 9; detected in Rhode Island ambient air, Mar 1987, 6

**Tetrahydrofuran:** May 1989, 9; verified RfC, Nov 1990, 2

**Tetrahydrothiophenes:** as refinery waste site contaminant, July 1984, 2

**Texas:** May 1989, 2-3; air toxics control program, Dec 1983 (4); Houston Regional Monitoring Program described, Mar 1988, 10; research division and functions of TACB, July 1984, 5; and special study identifying toxic air pollutants, Feb 1984, 6; spotlight on TACB, Jan 1988, 2-4; TACB pilot program assesses existing sources, May 1991, 1-2

**Threshold Ambient Limit (TAL):** May 1988, 3

**Threshold Limit Values<sup>R</sup> (TLVs):** See ACGIH TLV

**Tiers 1-7:** See National Dioxin Strategy

**Tire Manufacturing:** EPA proposes regulation of benzene from, Dec 1989, 11

**Toluene:** Jan 1989, 7, 8; Sept 1989, 3; May 1990, 5, 6, 8; regulatory status of under Clean Air Act, Dec 1985, 10; and EPA/IEMD ambient monitoring program, Apr 1984, 5-6; health impacts assessed in gasoline study, Dec 1989, 6-8; and Michigan's use of air stripping of VOCs, Dec 1985, 4; verified RfC, Nov 1990, 2

**Toluene-2,4-diisocyanate:** listed as Extraordinarily Hazardous Substance in New Jersey, Sept 1986, 5; possible accidental releases studied by CTC, June 1987, 4-5

**Total Suspended Particulate (TSP):** Dec 1986, 8; and EPA emissions inventory of carcinogens, June 1986, 10; and 1987 revision to NAAQS, Jan 1989, 4-5

**Toxic Air Monitoring System (TAMS):** May 1989, 2; Sept 1990, 5; data currently available described, June 1987, 9; established by EPA, Apr 1984, 7; to examine monitoring capabilities, Dec 1989, 11; functions defined, Mar 1986, 10; three monitoring sites established for, May 1985, 7

**Toxic air pollutants:** See Air pollutants, toxic

**Toxic Catastrophe Prevention Act:** passed by New Jersey, Sept 1986, 5

**Toxicity model:** and Michigan's air toxics control program, Feb 1984, 4

**Toxicity testing:** Oklahoma requires for biomedical waste incinerator ash, May 1991, 4

**Toxic Release Inventory:** May 1988, 1-2, 8; Mar 1991, 1-2; EPA surveys States' use of data base, Jan 1990, 4-5; Region VI uses in comparative risk, Sept 1990, 5; risk screening guide available, Sept 1989, 10-11

**Toxic Release Inventory System (TRIS):** May 1990, 3-4; July 1990, 3-5; access through NATICH data base, Dec 1989, 1-2; established, Nov 1988, 6-7; guide and hotline available, Sept 1990, 11; how to access, Nov 1988, 6-7; OTS and data quality audit, Sept 1990, 7; used in draft source category list development, Mar 1991, 1-2

**Toxic Substances Control Act (TSCA):** and chromium ban for cooling towers, May 1988, 9; and cooling tower standard for chromium, Sept 1990, 8-9; and EPA prototype scheme for handling toxic air pollutants, Sept 1984, 3-4; and Chemical Emergency Preparedness Program (CEPP), June 1986, 3; Federal activities in, July 1984, 4; grants to States, analysis of, July 1984, 4; and Indiana regulation, May 1990, 1; information collection record keeping requirements of, and EPA air toxics strategy, Aug 1985, 6-7; inventory of chemicals in commerce, July 1984, 4; status report for existing chemicals, July 1984, 3

**Trace metals:** trends in Dayton, Ohio, monitoring of, Mar 1988, 8

**Transfer operations:** EPA proposes regulation of benzene from, Dec 1989, 11

**Transformation models:** improvements suggested, Jan 1988, 8

**Treatment, storage, and disposal facilities (TSDF):** Mar 1989, 11; as contributor to air toxics problem, Sept 1984, 2; emissions inventory of in Chicago, Nov 1987, and EPA emissions inventory of carcinogens, June 1986, 10; EPA/ESED report on soil sampling, Dec 1986, 11; National standards for emissions from, July 1987, 9-10; responsibility for developing regulations transferred, Apr 1984, 5; standards for prepared by OAQPS, July 1989, 9-10; 6-7

**Tribromomethane:** and Michigan's use of air stripping of VOCs, Dec 1985, 4

**Trichloroethane, 1,1,1- (TCA):** Sept 1989, 3; May 1990, 5, 6, 8; detected in Rhode Island ambient air, Mar 1987, 6; and EPA/IEMD ambient monitoring program, Apr 1984, 5-6; link to ozone depletion, May 1989, 7-8; and Michigan's use of air stripping of VOCs, Dec 1985, 4

**Trichloroethylene:** May 1985, 6; Sept 1987, 12; Sept 1988, 3; July 1989, 7, 9; Sept 1989, 9; May 1990, 5, 6; regulatory status of under Clean Air Act, Dec 1985, 10; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; as contributor to air toxics problem, Sept 1984, 2-3; detected in Rhode Island ambient air, Mar 1987, 6; and EPA/IEMD ambient monitoring program, Apr 1984, 5-6; EPA decision on, Mar 1986, 9; and Michigan's use of air stripping of VOCs, Dec 1985, 4

**Trichlorofluoromethane:** and Michigan's use of air stripping of VOCs, Dec 1985, 4

**TSCA:** See Toxic Substances Control Act

**TSCA Assistance Office (TAO):** functions of, Apr 1984, 7

**Unit risk factors:** used in Dayton, Ohio, monitoring, Mar 1988, 8; Nov 1988, 3

**Uranium:** radon emissions from and indoor air, Mar 1986, 3-5; Uranium Mill Tailing Radiation Control Act, Mar 1986, 3; mines as sources of radionuclide emissions, Dec 1984, 8

**Urban aerosols:** and Harvard School of Public Health project, May 1985, 7

**Urban Air Toxics Monitoring Program (UATMP):** Sept 1990, 5

**Urban soup:** Jan 1988, 4; EPA high risk program on, Mar 1987, 6; EPA/OAQPS publishes report on, Jan 1989, 14; Maryland studies in Baltimore, Jan 1989, 12; NPPB issues document on, Sept 1989, 10; Ohio ambient air study, Nov 1988, 3; Ohio programs on, Mar 1987, 2; Philadelphia air toxics program and, July 1989, 9; PIPQUIC used to study, July 1989, 4-6; round-up on EPA's activities in all regions, Sept 1987, 6-7; Seattle ambient air study of, July 1988, 2; study of Midwest conditions, Jan 1990, 9; TAMS to examine monitoring of, Dec 1989, 11; treated in EPA's national air toxics strategy, Mar 1987, 9-10; Washington agency studies, June 1987, 7; workshop on, Mar 1989, 9-10

**Urea:** and ammonia plant in Alaska ammonia standard, Mar 1991, 1-2; dust and Air RISC research on effects of, Nov 1988, 4-5

**Users Network for Applied Modeling of Air Pollutants (UNAMAP):** Mar 1988, 2

**Vanadium:** and New York's toxic air contaminant stack assessment program, Aug 1985, 7

**Variance (for air toxics source):** defined by Wisconsin, Sept 1986, 3

**Vermont:** asks Air RISC styrene question, Jan 1991, 5; regulates CFCs, July 1989, 11; spotlight on Vermont Agency of National Resources, July 1989, 3-4; talc dust from quarry in, Nov 1988, 5

**Vinyl acetate:** verified RfC, Nov 1990, 2

**Vinyl chloride:** May 1985, 6; July 1990, 9; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5

**Vinyl cyclohexane:** May 1991, 9

**Vinylidene chloride:** May 1985, 6; Jan 1989, 4; July 1989, 9; May 1990, 8; court decision on and benzene regulation, Sept 1988, 9; regulatory status of under Clean Air Act, Dec 1985, 10; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; EPA draft source/emission factor report on, Dec 1984, 9; and EPA report on locating and estimating emissions of, Dec 1985, 11

**Virginia:** Air RISC addresses indoor air question in, Jan 1991, 5; finds carbon disulfide violation, Dec 1989, 4-5; joins air management association, May 1990, 2; noncriteria pollutant control rules adopted, Dec 1984, 5-6

**Volatile Organic Compounds (VOCs):** Nov 1987, 6; Jan 1988, 3; Nov 1988, 9; Jan 1989, 4, 7; Mar 1990, 9; Sept 1990, 5; AEERL studies indoor air sources of, Mar 1991, 4-5; and air stripping during groundwater clean up, Dec 1985, 2-3; and cancer, Dec 1984, 3; CTC publications on, Sept 1988, 4-5; emissions from equipment leaks, Jan 1990, 2-3; and EPA air toxics monitoring data base, June 1986, 11; and EPA emissions inventory of carcinogens, June 1986, 10; EPA/OAQPS report on, Nov 1987, 9; EPA Region X completes study of, Sept 1987, 5-6; and fiberglass marine structures, May 1989, 7; Houston monitoring program, Mar 1988, 10; Houston monitoring program and, May 1988, 3-4; from Idaho sugar beet processing, May 1988, 4-5; Louisiana prepares report on, May 1989, 9; Nebraska plans data collection on, Sept 1989, 3; North Carolina pollution prevention programs reduces, Sept 1989, 7; Ontario air toxics assessment, Mar 1988, 7; removed by air stripping, Dec 1989, 9; removed in vacuum extraction process, Jan 1990, 10; surface impoundment model to assist in estimating, Dec 1989, 5-6; as tracers of mobile source PM, May 1989, 5

**Volatile Organic Compounds Speciation:** EPA/OAQPS report on, Nov 1987, 9; species manual available, Nov 1988, 9-10

**Volatile Organic Sampling Train (VOST):** procedures for, Aug 1985, 8

**Waferboard:** CTC report on manufacturing plants, Dec 1989, 6; plant studied by CTC, June 1987, 4

**Washington:** agency conducts urban air toxics study, June 1987, 7; PSAPCA evaluates air toxics program, Mar 1990, 6-7; Puget Sound Water Authority evaluates atmospheric deposition, Dec 1989, 3-4; spotlight on PSAPCA, July 1988, 2-4; spotlight on PSAPCA, Nov 1990, 1; State proposes wood smoke legislation, June 1987, 6-7

**Waste-derived fuel:** Allegheny County (PA) regulation to control burning of, Dec 1986, 3; combustion and marketing of, Dec 1985, 4-5; New Jersey rule on, Apr 1984, 2

**Waste disposal:** see Hazardous waste disposal, Solid waste disposal

**Waste, hazardous:** May 1991, 7; and incineration at sea, Feb 1984, 6; and Puget Sound waste-derived fuel regulation, Dec 1985, 5

**Waste incineration:** see headings under Incineration

**Waste oil combustion:** NESCAUM presentation on, Sept 1984, 8; and toxic emissions, Dec 1984, 2

**Waste oil handling and disposal:** as risk assessment case study, Feb 1984, 5

**Wastewater treatment:** Sept 1988, 4; Mar 1989, 11; and California ethylene oxide rule, July 1990, 3; emissions inventory of in Chicago, Nov 1987, 6-7; and EPA emissions inventory of carcinogens, June 1986, 10; and New Jersey chemical accident prevention rule, Mar 1988, 7

**Water:** use of air strippers for, Mar 1988, 9

**Water quality analysis:** conducted at incinerator ash pile, Sept 1986, 9

**Water treatment plants:** and New Jersey chemical accident prevention rule, Mar 1988, 7

**Wisconsin:** authority to regulate air toxics upheld, Nov 1990, 4; program on hazardous air pollutants, Sept 1986, 2-4

**Wood preservatives:** bibliography of, Dec 1985, 9

**Wood smoke:** and Aspen, Colorado, regulation on woodburning, June 1986, 7-8; IACP studies nighttime plumes, Sept 1989, 5; and IARC evaluation of mutagenic activities of photo-oxidation products, June 1986, 5-6; Maine conducts assessment of, Dec 1986, 7-8; measurement of in IACP project to identify airborne carcinogens, Mar 1986, 7; mutagenicity of emissions of, Nov 1988, 3-4; OAQPS produces public source announcements, Nov 1990, 9; State of Washington proposes legislation on, June 1987, 6-7; study on woodstove emissions, Jan 1988, 11; tracers studied, June 1987, 9

**Woodstoves:** See also Combustion, residential wood-fired; and catalytic combustors, May 1985, 4-5; certification of in Washington State, July 1988, 4; emissions from analyzed by GC/MI-R, Sept 1987, 13; emissions from and conference on, Feb 1985, 6; emissions measured by IACP, Dec 1986, 9-10; and EPA Six Months Study, Apr 1984, 5; field study of conducted in Vermont and New York, Dec 1986, 8; included in Maine's wood smoke assessment, Dec 1986, 7-8; methods for sampling emissions of, Sept 1988, 11-12; operating characteristics and relation to smoke

**Woodstoves (continued):** tracers, June 1987, 9; "Reg Neg" used in drafting NSPS covering, Dec 1986, 7; as research area for AEERL, Feb 1985, 2-3; study of emissions of, Jan 1988, 11; Washington State proposes legislation to control emissions from, June 1987, 6; Washington State regulation on, July 1988, 2

**Wood treatment:** Sept 1988, 4

**Working group, NATICH:** appointment of, Dec 1983 (1, 3); approves NATICH objectives and guidelines, Feb 1984, 1

**Workplace exposure guidelines:** Wisconsin recommendations for, Sept 1986, 3

**Xylene:** May 1985, 6; Jan 1989, 7, 8; May 1990, 8; and California Air Resources Contaminant Identification and Control Process, Dec 1984, 5; detected in Rhode Island ambient air, Mar 1987, 6; and EPA/IEMD ambient monitoring program, Apr 1984, 5-6; health impacts assessed in gasoline study, Dec 1989, 6-8; and Michigan's use of air stripping of VOCs, Dec 1985, 4; verified RfC, Nov 1990, 2

**Zinc:** May 1990, 5, 6; and New York's toxic air contaminant stack assessment program, Aug 1985, 7

**Zinc oxide plants:** as inorganic arsenic emissions sources, Sept 1984, 9

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