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ABSTRACT

This listing and description of air pollution training resource materials was developed and compiled by the Air Pollution Training Institute (APTI) of the Environmental Protection Agency. The contents include APTI course descriptions and adjunct faculty in addition to a listing of films, audio cassette tapes, games and simulations, guest speakers, programmed texts, self-instructional materials, slide series and video tapes. These materials were developed and compiled for the use of the APTI faculty. (BT)

AIR POLLUTION TRAINING
RESOURCE MATERIALS LIST

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Water Programs
Office of Air Quality Planning and Standards
Control Programs Development Division
Air Pollution Training Institute
Research Triangle Park, North Carolina 27711

AIR POLLUTION TRAINING
RESOURCE MATERIALS LIST

COMPILED BY
THE AIR POLLUTION TRAINING INSTITUTE
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27711
NOVEMBER 1973

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Water Programs
Office of Air Quality Planning and Standards
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Air Pollution Training Institute
Research Triangle Park, North Carolina 27711

FOREWORD

This listing and description of training resource materials developed and compiled by the Air Pollution Training Institute of the Environmental Protection Agency has been prepared for the convenience and information of the APTI staff and faculty. EPA Regional Offices may also find it useful in the development and support of their own air pollution training efforts. When possible, listed materials will be provided to the Regions upon request. However, the materials are used frequently by APTI faculty in scheduled air pollution training courses and therefore, are not available on short notice.

Under normal circumstances, these materials will not be available to the general public because APTI has neither the facilities nor the personnel to operate a loan service.

For additional information, direct inquiries to:

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CONTENTS

AIR POLLUTION TRAINING INSTITUTE
COURSE DESCRIPTIONS

#405 Sampling and Identification of Pollen and Fungus Spore Aero-Allergens (4 1/2 Days)*

Instruction in this course is designed to enable the trainee to discuss and use various allergen sampling equipment, to identify selected aero-allergens, and to perform calculations necessary to arrive at a quantitative assessment of the allergens present in an atmospheric sample. This course is specifically designed for professional workers concerned with the sampling and identification of atmospheric allergens. Trainees spend approximately one-half of the course time in laboratory sessions and field exercises.

#411 Air Pollution Meteorology (5 Days)*

Meteorological effects and the role they play in the transport and dispersion of air pollution are delineated in this course presentation. It is designed for engineers and physical scientists responsible for measuring air pollution levels or for measuring and evaluating meteorological parameters which affect the diffusion and concentration of pollutants in the atmosphere. Each participant calculates estimates of continuous-release pollutant concentrations and becomes familiar with meteorological instrumentation and correct instrument exposure. Discussions are held which enable the trainee tc evaluate air pollution control factors related to site selection, control programming, and the planning and interpretation of surveys, as well as sources of meteorological information and the availability of additional professional assistance. Problem assignments require a working knowledge of first year college mathematics.

#413 Control of Particulate Emissions (4 Days)*

This course is designed for engineers and other technical personnel responsible for evaluating particulate collection devices. The fundamental mechanisms of collection are discussed and the efficiency of particulate control equipment is evaluated. Thirty percent of the student's time is devoted to problem sessions which illustrate the principles involved in particulate collection. With additional (empirical) data, the knowledge gained in this course will assist trainees in conducting plan reviews. Courses 413 and 415 are now scheduled sequentially in a two-week block.

*Corresponding course manuals are available for all courses followed by an asterisk (*).

#415 Control of Gaseous Emissions (4 Days)*

This course is designed for engineers and other technical personnel responsible for evaluating gaseous pollutant control equipment. At the conclusion of the course, the student will understand the operational characteristics of gaseous control equipment and be able (when analyzing industrial problems) to select appropriate gaseous pollution control equipment. In addition, this course will provide the technical knowledge to assist the trainee in conducting plan reviews of such control equipment. Courses 413 and 415 are now scheduled sequentially in a two-week block.

#420 Air Pollution Microscopy (4 1/2 Days)*

This course is designed for chemists, engineers and other professional personnel responsible for the identification of airborne particulates. Laboratory sessions enable the student to recognize and identify atmospheric particulates. Instruction is designed to afford the trainee a basic understanding of the procedures required to obtain representative samples of atmospheric pollutants that are characterized by microscopic examination. The course consists of lectures, laboratory exercises, and field exercises. The trainees obtain a knowledge of the component parts of the polarizing microscope and their functions. They are also familiarized with the special sampling and sample handling techniques used in microscopic analysis.

SI 422 Air Pollution Control Orientation Course

This self-instructional course, consisting of audio cassette tapes and printed booklets, provides a broad understanding of the air pollution control field--air pollution law, sources, effects, meteorological aspects, sampling and analytical techniques, control methods, control regulations, enforcement procedures, air quality management. Recording time is approximately six hours. Tests required for receipt of a certificate of completion may be obtained from the Manpower and Training Representative in each EPA Regional Office. NOTE: Students must have received a certificate for this course before applying for Course 452. Copies of Course SI 422 are available in EPA Regional Offices and state and local agencies for use by agency employees. Additional copies may be obtained from the National Audiovisual Center, Washington, D.C. 20409.

#423 Diffusion of Air Pollution--Theory and Application (5 Days)*

(Prerequisite): Course 411 or similar training. This course is designed for meteorologists working in the field of air pollution who have not had extensive experience making dispersion estimates or applying dispersion models. The course covers the development of selected theories of diffusion and the state of the art in dispersion modeling. The application of diffusion and plume rise formulas to actual situations is discussed so that the student can evaluate the accuracy of calculations.

The trainee estimates pollutant concentrations by Pasquill's method; learns to discuss and apply the concepts employed in several atmospheric dispersion models for point, line and areas; becomes familiar with turbulence instrumentation and learns data reduction techniques for use in the field.

#426 Statistical Evaluation of Air Pollution Data (4 Days)*

This course is designed for professionals responsible for the collection and analysis of air pollution data. It is intended to provide the student with a thorough understanding of the concepts and application of statistics to Air Quality Studies. At the end of this course, the student should be able to apply statistical methods to air pollution data. The lectures and problem sessions are intended to give a thorough knowledge of basic graphic and statistical techniques for reporting air pollution data. The lectures will give the student a working knowledge of statistical methods and describe some of the advantages and disadvantages of the methods.

#427 Combustion Evaluation (5 Days)*

Designed for engineers and other personnel engaged in the evaluation of combustion processes, with specific emphasis directed toward the air pollution potential of the various combustion processes. At the conclusion of this course, trainees will be familiar with combustion principles and fundamental calculations and, by utilizing these principles, will be able to evaluate the air pollution potential of fossil-fuel energy sources and waste disposal incinerators. They will also be able to evaluate the operational characteristics of combustion devices designed to reduce the emissions of air pollutants into the atmosphere. Knowledge gained from the course will assist the trainees in conducting plan reviews.

#429 Gas Chromatographic Analysis of Air Pollutants (5 Days)*

Prerequisite: Satisfactory completion of pre-course instructional material relating to gas chromatography fundamentals. Through use of gas chromatographs in the laboratory, students are introduced to practical fundamentals of gas chromatography and qualitative and quantitative techniques necessary for measurement of atmospheric pollutants. Quantitative methods include internal standard techniques and absolute or direct calibration methods. Qualitative methods include comparison of retention volume with known standards, use of Kovats Retention Indices, and McReynolds Retention Data. Ancillary methods include the use of effluent splitters, collectors, and liquid sample preparation for infrared analysis. A brief introduction to the interpretation of infrared spectra is also included. Approximately 75 percent of the student's time is spent in the laboratory operating gas chromatographs and performing quantitative and qualitative determinations.

#431 Air Pollution Control Technology (4 Days)*

This course is designed for technical personnel who make field inspections of sources of air pollution. At the conclusion of the course the students will be familiar with general operating principles and specific industrial application of major particulate and gaseous air pollutant control devices. This course does not include a technical analysis of these control devices, and is suggested as a survey course prior to enrollment in courses 413, 415, and 450.

#435 Atmospheric Sampling (4 1/2 Days)*

Prerequisite: Course SI 422 or equivalent experience. Offered to chemists, engineers, and technicians responsible for atmospheric sampling, for the primary purpose of teaching the student to select and apply sampling methods appropriate to air quality monitoring. Approximately 75 percent of the course involves laboratory or work sessions in which the student will utilize the basic principles employed in atmospheric sampling. These principles consist of the calibration, location, and operation of air sampling devices.

#436 Measurement of Atmospheric Metals (10 Days)

Prerequisite: A fundamental knowledge of analytical chemistry. This course is designed for chemists and other scientific personnel responsible for the qualitative and quantitative determination of metals present in the atmosphere. Students are given a working knowledge of separation and analysis techniques for metallic pollutants present in ambient air. Eighty percent of the student's time will be spent in the laboratory separating, identifying, and measuring metallic pollutants.

#439 Visible Emissions Evaluation (3 Days)*

This course is designed for air pollution control personnel responsible for the establishment and operation of agency-supported training schools involved with visible emissions evaluation. Instruction provides the trainee with an understanding of the comparative devices and techniques used to evaluate visible emissions based upon opacity concepts. The student will be familiar with the legal concepts of plume evaluation systems, typical code limitations currently in use, and the methods employed to certify and recertify clients in the practice of making visual evaluation of plumes. The students will also obtain a knowledge of the systems, construction components, maintenance, and operation of equipment used to train emissions evaluation personnel.

#444 Air Pollution Field Enforcement (3 Days)*

This course is offered to anyone who has the responsibility and authority to enforce air pollution control laws in the field: field inspectors and engineering inspectors who handle citizen complaints,

investigate suspected air pollution control law violations; those who make periodic inspection of potential air pollution sources. At the conclusion of this course, the student should be able to make an investigation in such a manner that findings will be admissible in a court of law and present testimony in court in such a manner that will be admissible.

#447 Meteorological Instrumentation in Air Pollution (5 Days)*

Prerequisite (for non-meteorologists): Course 411 or similar training. This course is designed for engineers and technical personnel responsible for designing, procuring and maintaining air pollution measuring instrument systems and networks that include meteorological sensors. At the conclusion of the course the trainee will understand the physical principles upon which instrumental sensing and recording of those weather elements important in air pollution are based. The student becomes acquainted with the desirable properties of a meteorological instrument system, their application and limitations with respect to specific types of measurement programs, and the evaluation of these properties by observing demonstrations and working exercises in the laboratory. The trainee becomes familiar with meteorological data reduction methods and computer programs for processing these data into tabulations and summaries. The student will also become familiar with existing air quality and meteorological instrument systems and telemetered networks.

#448 Effects on Vegetation (3 Days)*

Instruction in this course is designed for state and local air pollution control agency personnel interested in obtaining a basic knowledge of air pollution effects on vegetation. In addition to being familiar with the most important physiological and anatomical characteristics of plant life, the student should be able to recognize indicators of pollution effects on vegetation so as to be able to alert experts of possible air pollution damage to vegetation. The student should also know how to work more effectively with state and local agricultural personnel upon completion of the course.

#450 Source Sampling for Particulate Pollutants (4 Days)*

This course is for engineers and engineering technicians who act as leaders or members of source-testing teams. Primary emphasis is on sampling for particulates by means of the isokinetic sampling methods recommended in the December 23, 1971, edition of the Federal Register. The following tasks are performed by trainees: calibration, presurvey measurements, setting nomograph, assembly of source-sampling train, sampling, and calculation and presentation of the results.

#452 Principles and Practice of Air Pollution Control (5 Days)*

Prerequisite: SI 422 or equivalent experience. This basic 5-day course provides a comprehensive introduction to the technology of air pollution control. The student receives classroom training in the principles and practice of pollution control technology, legal bases for control, meteorology, and program administration. Additional classroom training and laboratory practice develop basic skills related to sampling, plume evaluation, laboratory analyses, field studies, and data evaluation. Emphasis is placed upon group interaction through participation in workshops, seminars and problem sessions.

#454 Environmental Training Simulations (5 Days)

This course is designed for environmental training specialists and university faculty members who wish to apply complex simulation exercises to environmental problem-solving situations. At the conclusion of the course, the participant will be able to operate the major simulation model pre-selected by the course moderator for in-depth presentation. The model may be either APEX, Cities, or River Basin. Other exercises will include discussions of a Strategy-Effectiveness Model and several environmental impact evaluation models; the student who has special training needs may be released to devote time to these simulations. These exercises are designed to be used in EPA Regional training programs and in university courses.

#455 Air Pollution Principles for Planners (3 Days)

Prerequisite: Satisfactory completion of pre-course instructional materials. This course is designed for urban and regional planners with no technical knowledge of air pollution control. Meteorological and air pollution control principles most relevant to urban and regional planners are presented. Students apply selected tools and techniques to specific problems in workshops and learn practical applications of these principles through case studies and discussions with Federal, state, and local officials who assist in presenting the course. A primary course objective is to foster closer working relationships between planners and air pollution control personnel, several joint course sessions are conducted with students attending Course 456 (Regional Planning for Air Pollution Control Officers). (Professionals employed by air pollution control agencies should forego this course and apply for Course 456 (Regional Planning for Air Pollution Control Officers).

#456 Regional Planning for Air Pollution Control Officers (3 Days)

This course is designed for air pollution control agency personnel with no formal training or experience in planning. The objective of the course is to foster a closer working relationship between air pollution control personnel and planners and to introduce the student to basic planning concepts, approaches and terminology, plus specific applications

in land use and transportation. Meteorological factors that affect both air quality control and planning are discussed. Practical applications are surveyed both through discussion of specific case studies and through participation of Federal, state and local officials who actively assist in conducting the course. In addition, several joint sessions are held with students attending Course 455 (Air Pollution Principles for Planners).

#457 Workshop on Environmental Quality Planning (3 Days)

This course provides a survey of the complex interrelationships between several functional programs which have statutory responsibility for protecting and enhancing environmental quality. The emerging techniques which EPA and other agencies are developing to evaluate the environmental impact of policies and programs will be presented. The environmental effects of various land use and transportation planning decisions will be outlined together with those tools which can be used to arrive at rational decisions, especially in the area of environmental impact statements. Course emphasis will be placed upon specific cases in a problem-solving workshop context. The course is designed for persons holding planning or policy-making positions in public agencies which interface with the environment.

SI 458 Air Pollution Administration I (Available January 1974)

This course material is now available as a self-instructional package for use as part of an on-the-job training program designed to assist air pollution control agency personnel who will be assuming new managerial positions. Completion of the package serves as a satisfactory prerequisite for enrollment in the more advanced courses in air pollution administration conducted by the Institute.

#459 Air Pollution Administration II (3 Days)

Completion of Course SI 458 (Administration I) is highly recommended. This course is designed for mid-level supervisory personnel in an air pollution control agency who have responsibility for establishing work requirements and work measurement techniques, and for evaluating the performance of the personnel employed in the agency. The student will learn to apply workload statistics techniques to the control agency's functions, project manpower requirements, and determine training needs for staff development. Federal, state and local officials will assist in conducting this course.

#460 Air Pollution Administration III (3 Days)

Prerequisite: Completion of Course SI 458 (Administration I) or a basic understanding of agency operations. This course is directed toward Air Pollution Control Officers and other supervisory personnel involved in program planning and resource management. The student will learn to utilize information systems and budget control principles and to interpret current Federal requirements for state and local program support through discussions with Federal officials assisting in the course presentation.

#461 Air Pollution Systems Management (3 Days)

Prerequisite: Satisfactory completion of pre-course materials. Completion of Course SI 458 (Administration I) or equivalent is recommended. This course is designed for managers of air pollution control programs. The course provides the trainee with modern management tools for solving problems facing state and local control programs. Examples of and aids to decision-making will be related directly to the field of air pollution control agency management. Problem-solving sessions will involve application of linear programming, benefit/cost analysis, and P.E.R.T. One session is devoted to storage in and retrieval from several currently available information systems. Federal, state, and local officials will assist in conducting this course.

#462 Air Pollution Agency Planning Seminar (2 Days)

This advanced problems course is designed for air pollution control agency planning personnel who have the responsibility for policy formulation, development of regulations, and operating procedures. Subject matter, presented and discussed in seminar format, is structured to examine current legislation at the Federal, state, and local levels. The participants will work closely with Federal officials directly responsible for grants, enforcement, implementation plans, agency procedures, and other air pollution topics. Attendance will be primarily by invitation, and the seminar may be adapted to EPA Regional Training Centers.

#463 Air Quality Monitoring Systems (Planning and Administrative Concepts) (5 Days)

This course is offered to chemists, engineers, and other professionals having major responsibilities in the planning, administration, and operation of air quality monitoring systems. The course is designed to provide maximum benefit to new air pollution personnel or to experienced air pollution personnel who are presently specializing in other areas. The course includes classroom presentations, panel discussions, demonstrations of data handling systems, and simulation exercises. Toward the end of the course, the participant will design an air quality surveillance system to meet specified objectives. This project will include a

delineation of parameters to be measured, sampling site locations, frequency and duration of sampling, analytical methods, and laboratory requirements, plus a data acquisition and retrieval system. The data system will include the basic elements of recording, storage and transmission, validation, and data reduction.

#464 Analytical Methods for Air Quality Standards (10 Days)*

This course is designed for chemists and laboratory technicians responsible for the measurement of ambient air quality. Emphasis is placed upon the reference methods of air quality standards for sulfur dioxide, nitrogen dioxide, photochemical oxidants, reactive hydrocarbons minus methane, carbon monoxide, and particulates. About 75 percent of the course is devoted to laboratory procedures. Analytical determinations are made on air samples, results are computed, and interpretation of results is discussed. A special seminar is held to review current research on new analytical developments and instrumentation. Completion of all classroom and laboratory sessions requires 10 days. However, consideration will be given to candidates for special training who wish to forego the majority of the formal course offering and instead concentrate on selected segments relating to any of the six pollutants listed above.

#465 Determination of Polycyclic Aromatic Hydrocarbons (3 Days)*

Prerequisite: A fundamental knowledge of organic chemistry. Emphasis is placed upon the qualitative and semi-quantitative determination of polycyclic aromatic hydrocarbons (PAH) present in the ambient air which are known or suspected carcinogens. Although determinations will be made for specific compounds, the primary objective of the course is to provide training for the analyses of PAH. Approximately 70 percent of the student's time is spent in laboratory sessions devoted to the separation and identification of PAH.

#467 Special Two-Day (Reference Methods) Laboratory Courses at the Institute's Research Triangle Park Laboratories

Prerequisite: Experience in qualitative analysis at the chemist or chemical technician level. The primary objectives of these three special two-day laboratory courses are: (1) For the participants to be able to (a) perform all of the essential steps required in the recommended reference methods; and (b) sample and analyze a number of unidentified samples with precision and accuracy within acceptable limits as determined by collaborative testing of the method. (2) For the participants to thoroughly understand the rigid procedures required to obtain and report accurate air quality data. To meet these objectives, the participants must become knowledgeable of the guidelines developed to establish quality assurance programs. These courses will include quality control methods that may be used to determine daily analytical performance after precision and accuracy have been established. Such daily evaluations are necessary

to assure valid data. These special two-day courses are: Course 467A: Reference Method for the Determination of Sulfur Dioxide in the Atmosphere (Pararosaniline Method). Course 467B: Reference Method for the Determination of Carbon Monoxide in the Atmosphere (Non-dispersive Infrared Spectrometry). Course 467C: Reference Method for the Measurement of Photochemical Oxidants corrected for Interference due to Nitrogen Oxides and Sulfur Dioxide.

#468 Source Analysis (4 Days)

Topics to be announced.

BY SPECIAL ARRANGEMENT . . .

Special Topics in Air Quality Management (2-5 Days)

(By special arrangement upon written request) The content of this seminar is adjusted to meet needs of groups in specific geographical locations. Topics for discussion are carefully selected and designed to seek solutions to problem areas described by the requestors. Arrangements for this special presentation are made through a written request to the appropriate EPA Regional Office.

Special Topics in Engineering and Enforcement (2-5 Days)

(By special arrangement upon written request) The content of this seminar is adjusted to meet needs of groups in specific geographical locations. Topics for discussion are carefully selected and designed to seek solutions to problem areas described by the requestors. Arrangements for this special presentation are made through a written request to the appropriate EPA Regional Office.

Special Topics in Surveillance and Laboratory Techniques (2-5 Days)

(By special arrangement upon written request) The content of this seminar is adjusted to meet needs of groups in specific geographical locations. Topics for discussion are carefully selected and designed to seek solutions to problem areas described by the requestors. Arrangements for this special presentation are made through a written request to the appropriate EPA Regional Office.

Special Training in Surveillance and Laboratory Techniques

(By special arrangement upon written request) The new laboratory facilities provided for the Institute's training activities, located in the National Environmental Research Center in North Carolina, now make it possible to provide special training beyond formal courses This training, available to surveillance and laboratory personnel, emphasizes the application of reference methods performed on an individual basis. This instruction features bench-side training which can be tailored to the specific needs of the requesting program. This individualized training (available to small groups or individuals) can be designed to stress particular techniques or aspects of sampling and analysis. Students receive individualized instruction and participate in informal discussions with staff members.

AIR POLLUTION FILMS

ADIABATIC PROCESS

13 minutes, color, sound, 16MM

This film is the second in a series of four U.S. Navy Training Films on Atmospheric Stability and Instability. Convection and mechanical convections are discussed along with the dry adiabatic and moist adiabatic lapse rate. A parcel of air being forced over a mountain is used as an example to illustrate the adiabatic process.

AFTER THE SMOKE CLEARS

15 minutes, color, sound, 16MM

This film shows the effects of air pollution on vegetation and buildings in Chattanooga, Tennessee. It discusses and compares the local respiratory disease rates to the national average.

AIRBORNE GARBAGE

16 minutes, color, sound, 16MM

This film describes the Vancouver, B. C. air pollution problems, and features some very good pictures of air pollution sources. The informal narration can be easily understood by the layman.

AIR OVER WASHINGTON

This film shows the main contributors of air pollution damage to vegetation and buildings in the Washington, D. C. area.

AIR POLLUTION

30 minutes, B&W, sound, 16MM Kinescope

A TV interview conducted by WWL in New Orleans concerning the New Orleans Asthma Study. V. C. MacKenzie and A. Prindle discuss air pollution. An M.D. from Tulane University discusses asthma. The co-directors of the survey, an M.D. and Ph.D. engineer, describe the meteorological variables and the epidemiological experiment they are planning. The equipment shown is an automatic recording tape densitometer, a Cenco Air Pollution Test Kit, 1106B glass fiber, a hi-vol sampler, and a soxhlett extractor. (Released by WWL TV, New Orleans, Louisiana.)

AIR POLLUTION AND PLANT LIFE

15 minutes, color, sound, 16MM

This film shows air pollution damage by the major pollutants, fluorides, SO_2, and oxidants. Some mention of minor pollutant damage is made. Plants depicting varying degrees of susceptibility to each pollutant are also shown.

AIR POLLUTION IN THE METROPOLITAN KANSAS CITY AREA

15 minutes, color, sound, 16MM

This film was made after a survey was requested by airport authorities and airline pilots in the Kansas City area. The cooperative efforts of two states are applied to the problems of air pollutants traveling across state boundaries.

THE ANSWER IS CLEAR

14 minutes, color

Air pollution is a more complicated subject than most people realize, and this film points out many interesting facts, and problems, observed through the eyes of a wise and knowledgeable bus driver played by Wally Cox. He explains —— and demonstrates —— that diesel powered buses and trucks are not necessarily the culprits they are often assumed to be. A number of contributing factors to a wide range of air pollution problems are presented in an entertaining fashion. The advances that have been made in eliminating objectionable exhaust emission from internal combustion engines are described, plus some suggestions are offered for future improvements in exhaust emission control.

ASPHALT BATCHING PLANTS

10 minutes, B&W, sound, 16MM Kinescope

The film covers the process of asphalt production, and the available techniques and equipment for controlling pollutants from asphalt plants. This includes the location and function of the typical process equipment, the sources of gaseous and particulate emissions and the means for reducing these emissions. It describes the performance and operating characteristics of the typical control devices.

AUTOMOTIVE EMISSION CONTROL

25 minutes, color, sound, 16MM

This film features excellent graphics and animation techniques of control devices such as spark advance controls, vapor control systems, and PCV systems. The combustion cycle is also illustrated. The 1965, 1968 and 1970 automobile emission levels are also summarized.

BEWARE THE WIND

22 minutes, color, sound, 16MM

The origins of dirty air, in American and European capitals, are shown. The film, narrated by Robert Preston, identifies the principal air pollution sources: industrial operations, burning dumps, motor vehicles, and combustion of the fossil fuels —— coal and oil. The effects of air

pollutants on animals, people and property are described. The application of available technology to bring about cleaner air through the efforts of a concerned citizenry is highlighted.

BURNING YOUR FUEL

10 minutes, B&W, sound, 16MM

This film discusses boiler heat losses. These steps include: (1) coking the fuel; (2) sprinkling the coal with water; (3) side firing; (4) filling holes in fuel beds; (5) careful adjustment of damper; and (6) increasing secondary air after firing.

BY LAND, SEA, AND AIR

31 minutes, color, sound, 16MM

Today's threatening environmental crisis will never be solved if viewed solely as a scientific problem. The forces of economics, politics, and people must also be considered. This is the message of BY LAND, SEA, AND AIR, a new film which examines these four factors as it focuses on the havoc that pesticides have wrought on the California environment. In that state, striking farm workers, spurred by years of countless injuries from pesticides, are now demanding controls over their use. The destruction of the process of photosynthesis, the disruption of the reproductive cycles of wildlife, and genetic changes have been influenced by the use of these pesticides.

CALCULATION OF ESTIMATED EMISSIONS

20 minutes, Kinescope

This film shows the necessary procedures and calculations for making an emission inventory.

CHEMICAL CHANGE AND TEMPERATURE

14 1/2 minutes, color, 16MM

What happens when something burns? Using an inductive approach, this film explores the role of temperature in combustion. Many facts about chemical changes can be explained by using the idea that the reacting substances are made of atoms and molecules when they collide. By indirect observation and various analogies, the film investigates several ways in which temperature might affect the motion of molecules in gases and solids, and the collisions between them. A mechanical model is used to suggest how these factors would interact to affect the frequency of collision and hence the speed of the reaction.

CLEANER CARS FOR CLEANER AIR

15 minutes, color, sound, 16MM

Shows in general terms how cars are tested for emissions. Shows the dynamometer and other test equipment and procedures.

COLLECTION OF PARTICULATE MATTER IN THE CONTROL OF AIR POLLUTION

22 minutes, color, sound, 16MM

This film shows the basic methods of reducing particulate emissions, the mode of operation and the efficiencies of the equipment involved. (1966-1967)

COMBUSTION: AN INTRODUCTION TO CHEMICAL CHANGE

16 minutes, color, 16MM

Using combustion as an example of a chemical change, this film serves as an elementary introduction to the nature of chemical change and the conservation of matter. It is shown that new substances are formed as a result of chemical change and that, in the case of combustion, these new substances incorporate oxygen atoms. Because oxygen combines with the burning substance, the products of combustion weigh more than the original material. If we remove oxygen, we can often obtain the original substance.

COMBUSTION FOR CONTROL OF GASEOUS POLLUTANTS

12 minutes, color, sound, 16MM

This film theorizes the control of gaseous pollutants by the use of combustion. The film graphically illustrates the principle of the combustion variables: Time, Temperature, Turbulence, and Oxygen. It shows various oxidation combustion systems (1967).

CONTROL OF AIR POLLUTION

5 minutes, color, sound, 16MM

This film shows many sources of air pollution and some of their harmful effects. The theme is that an air pollution problem does exist in this country and it could and should be controlled. No actual control devices are shown.

DAWSONVILLE, GEORGIA - SMOKE TEST - APRIL 24, 1957

6 minutes, color, silent, 16MM

A white plume is released in a valley clearing. The film follows the path of the plume down a valley. After this first plume has blown down the valley, a second plume is released at the same point. Both plumes behaved in a conventional manner.

DAWSONVILLE, GEORGIA - SMOKE TEST JULY 11, 1957

6 minutes, color, silent, 16MM

A white plume is released in a valley clearing, and rises until it hits an inversion. At this point, it splits in half and goes in two opposite directions. The valley is soon completely filled with smoke. The plume again splits at the inversion —— with 10 percent of the smoke traveling in one direction; and the remaining 90 percent traveling in the other direction.

DENVER INVERSION TIME-LAPSE

4 minutes, color, silent, 16MM

This film shows views of the general area, and a strong inversion is observed. The time-lapse photography records the inversion breakup, but heavy cloud cover and underexposed sections of film are distractions. No significant increase in visibility can be seen after the inversion breakup.

DON'T LEAVE IT ALL TO THE EXPERTS

16 minutes, color, sound, 16MM

The theme of this motion picture is public concern and air pollution. The film explains how the major provisions of the Clean Air Act can affect all of us. The mechanisms for individual expressions of this Act are explored. It suggests the part the concerned citizen may have in bringing about healthful air in the Federally-designated Air Quality Control Region in which he lives.

EFFECTS OF AIR POLLUTION

5 minutes, color, sound, 16MM

This film shows some of the various effects of air pollution on man's health, crops, and material possessions.

ENVIRONMENT

29 minutes, color, 16MM

The degradation of our environment is a major problem. However, the causes of this deterioration are complex and are closely bound to the strengths of a modern industrial society: affluence, advanced technology and individualization. This film probes beyond the superficial rhetoric of ecology and shows that while such practices as high-technology farming can be destructive to the land, the products of this farming are vitally needed. What balances must be struck? After posing these questions, this unusual and highly dramatic film is left open-ended.

EXISTING TEMPERATURE DISTRIBUTION

13 minutes, color, sound, 16MM

This is the first in a series of four U.S. Navy Training Films on Atmospheric Stability and Instability. The purpose of the four films is to train the student in how to recognize stable and unstable conditions. The first film is divided into the following sections:

1. How to recognize stability and instability.
2. How to measure stability and instability.
3. How temperature affects stability and instability.

EXPEDITION: CITY FALLOUT by WABC TV, New York

27 minutes, B&W, sound, 16MM Kinescope

This film, narrated by Miss Jan Cracker, opens with a general discussion of the worsening air pollution problem; and reaches the conclusion that it is everyone's problem. The remainder of the program is broken down under the following subject headings:

1. Examples of air pollution sources.
2. The effects of air pollution.
3. Examples of what is being done.
4. Tour of New York Air Pollution Control Laboratory.
5. Effects of air pollution on health (an interview with a chest surgeon).
6. Special statement by Vernon MacKenzie of the Division of Air Pollution Control.

EXPERIENCE IN AIR POLLUTION

12 minutes, color, sound, 16MM

This film depicts grammar school students in a science class performing experiments in cooperation with Rutgers University.

THE FACELESS MENACE

7 1/2 minutes, color

The Faceless Menace establishes the existence of a serious air pollution problem, traces its developing history, and suggests a course of action to help acquire cleaner air. (Junior high school level)

FIRING YOUR FUEL

15 minutes, B&W, sound, 16MM

This film discusses the principles of mechanical stoking. The difference between overfed and underfed firing devices is illustrated. The following overfed devices are shown: (1) springing stoker; (2) chain grate stoker;

(3) coking stoker. The operation of the resort or underfed stoker is also described. Suggestions are given for steadier fuel with a minimum of loss. These include: (1) constant rate of fuel supply; (2) uniform fuel distribution; and (3) stable air control.

THE FIRST MILE UP

28 minutes, B&W

The experience of cities in North America that are making vigorous efforts to combat air pollution is particularly well illustrated in this film. Toronto's smoke prevention efforts are featured.

FOR ALL TO ENJOY

15 minutes, color, sound, 16MM

This film shows the effects of air pollution on vegetation, houses, etc., in Kentucky, Ohio, and West Virginia.

GENERAL MOTORS PRESENTS A REPORT ON AIR POLLUTION

18 minutes, color, sound, 16MM

A documented study of air pollution, concentrating on the pollutants which form smog. A combination of color cinematography and graphic illustrations is used to show the cause and effect and the combatant efforts in the field of automotive pollution.

THE HUMAN BODY: RESPIRATORY SYSTEM

14 minutes, color, sound, 16MM

This film explains the main functions of the lungs: exchanging gases, the process of ventilation, breathing, diffusion of gases and the adjustment to energy requirements. It also explains the terminology of physiological parts.

ILL WINDS ON A SUNNY DAY

28 minutes, color, sound, 16MM

Actor James Garner narrates this film which explores the problems and progress being made in the complexities of national air pollution problems. It contains statements from various congressional members of a Federal Committee on Air Pollution.

INCINERATION

12 minutes

The principles of incineration are illustrated in color cinematography and graphic art.

INFRARED SPECTROSCOPY

28 minutes, color, sound, 16MM

This film discusses the theory, instrumentation, and application of infrared spectroscopy. A brief segment is devoted to the interpretation of infrared curves.

LET'S CLEAR THE AIR

29 minutes, B&W, sound, 16MM Kinescope

This television documentary was produced in Steubenville, Ohio. The air pollution problems —— and combatant measures used by the state —— are described.

NO SMOKING

7 minutes, color, sound, 16MM

This is a film report on visible exhaust emissions from motor vehicles. The theme is how to recognize smoke offenders. Different types of exhaust commonly seen are simulated. Exhaust emissions from various sources ranging from good to bad are shown.

ORIGINS OF WEATHER

13 minutes, color, sound, 16MM

This film explains how the earth is protected from extremes of heat and cold by the thin layer of atmosphere which surrounds it. It shows that the sun's heat is distributed by moving masses of air, and the activities of cold and warm "fronts" produce constantly changing weather conditions over the surface of the earth.

OUR AIR

19 minutes

This is a study of various forms of air pollution and the steps being taken to control them. The film touches briefly on auto pollution. It gives a detailed study of sulfur and industrial pollution and combines color cinematography with graphic animation.

PALL OVER AMERICA

14 minutes, B&W, sound, 16MM

A documentary film on smog and its relationship to health in America's cities. (National Educational TV, 1965)

PARADISE POLLUTED

19 minutes, color, sound, 16MM

This 1968 documentary shows the destruction, caused by air and water pollution, to our national resources.

POLLUTION

3 minutes, color, sound, 16MM

A cartoon character accompanies various pictorial illustrations of pollution with song. Sung by Tom Lehrer.

PREPARATION AND ANALYSIS OF CONTROLLED ATMOSPHERES BY GAS CHROMATOGRAPHY

15 minutes, color, sound, 16MM

This film shows the use of the gas chromatograph in analyzing prepared atmospheres containing five hydrocarbon compounds. This film is designed for the training of a technician.

PRINCIPLES OF GLOBAL WEATHER CIRCULATION

9 minutes, color, sound, 16MM

Describes hemispheric air currents and pressure systems and how they affect weather patterns in the hemisphere.

ROLE OF THE WITNESS

45 minutes, color, sound, 16MM

This dramatized story shows the air pollution control official and what his role as a witness may be in a civil court suit.

THE RUNAROUND

color, sound, 16MM

With satirical animation, this film follows the adventures of a Mr. Hack, our average man who is determined to track down the sources of air pollution. His search leads him from one pollution source to another, each admitting partial fault, each claiming vast attempts at clearing the air, and each passing the buck to the next party. At the conclusion of the trip Mr. Hack proves that he, too, is part of the vast Run-Around, in placing his own personal interests before the need to participate in the fight against air pollution. The film concludes with a lecture by Senator Muskie on citizen participation in air pollution control.

SANTA BARBARA

3 minutes, B&W, silent, 16MM

An inversion demonstration box is shown as the introduction. This time-lapse film of Santa Barbara shows the build-up of pollution during an inversion and the following inversion breakup.

SMOKE DIFFUSION STUDIES

21 minutes, color, silent, 16MM

Studies were conducted at the Argonne National Laboratory in 1952 by a meteorological group. The tests show smoke plume behavior under different meteorological conditions. It shows two or three different colored plumes emitted at the same time —— but at different elevations.

SMOKE DIFFUSION STUDIES

15 minutes, color, silent, 16MM

This is a duplicate copy of SMOKE DIFFUSION STUDIES listed above. A segment of this film has been extracted and edited by D. B. Turner, and has been incorporated into the film listed below.

SMOKE DIFFUSION STUDIES

6 minutes, color, silent, 16MM

A short film composed of materials extracted from the 15 minute version of SMOKE DIFFUSION STUDIES. This film demonstrates smoke plume behavior under varying meteorological conditions; it shows two or more different colored plumes emitted at the same time —— but at different elevations. A short section of time-lapse photography of a plume is shown.

SOURCE INVENTORY

15 minutes, B&W, sound, 16MM, Kinescope

This presentation shows the steps necessary in estimating the quantity of pollutants released into the atmosphere. Emphasis is on delineating the sources, the pollutants to be studied, locating the sources and enumerating the quantity of pollutants emitted.

SOURCE SAMPLING EQUIPMENT

10 minutes, color, silent, 16MM

Various aspects of the use of source sampling equipment are shown in this film.

SOURCES OF AIR POLLUTION

5 minutes, color, sound, 16MM

This film was produced by the Department of Health, Education and Welfare. The movie shows a variety of sources of air pollution. The theme is that we are polluting the air we breathe and live in.

PAGE 23 WAS MISSING FROM THIS DOCUMENT

PRIOR TO ITS BEING SUBMITTED TO THE

ERIC DOCUMENT REPRODUCTION SERVICE.

TOMORROW'S WORLD (Part I)

30 minutes, B&W, sound, 16MM Kinescope

The subject of the program is "What is in the Air?" It is the first of four television programs on air pollution presented by RATSEC. The moderator of the program is Mr. John Durrell. The program opens with the film Sources of Air Pollution. A panel composed of Mr. Nader, Dr. Altshuller, and Mr. Tabor discuss respectively the topics of "How to Sample for Air Pollutants", "Methods of Identifying Samples", and "What is Being Done Around Our Cities."

TOMORROW'S WORLD (Part II) 30 minutes, B&W, sound, 16MM Kinescope

The subject of the program is "Air Pollution Sources and Accumulation." It is presented by the Robert A. Taft Sanitary Engineering Center. The moderator of the program is John Durrell; the panel members and topics they discuss are:

1. Mr. MacKenzie - The Importance of Air Pollution Control.
2. Mr. Sheehy - The Importance of Invisible as Well as Visible Pollutants.
3. Mr. Spaite - A Variety of Air Pollution Sources.
4. Mr. McCaldin - Measurement of Volume of Air Pollutants by Effects and Emission Inventory.
5. Mr. McCormick - An Inversion and Its Relationship to Air Pollution Control.

TOMORROW'S WORLD (Part IV)

30 minutes, B&W, sound, 16MM Kinescope

The subject of the program is "Control of Air Pollution." The program moderator is T.F. Williams. The DHEW film, Control of Air Pollution, is shown early in the program. The panel members and the subjects they discuss are as follows:

1. Mr. L. E. Niemeyer - Weather and Terrain.
2. Mr. A. H. Rose - Engineering Control.
3. Mr. A. N. Heller - Implementation of Air Pollution Control Program.

TOWARD CLEANER AIR

14 minutes, color, sound, 16MM

This film discusses various air pollution sources, problems and appropriate control strategies employed in a national program directed toward achieving clean air.

URBAN IMPACT ON WEATHER AND CLIMATE

16 minutes, color, sound, 16 MM

Climate and weather changes occur as man becomes more and more urbanized. This 1973 film introduces models illustrating how different surfaces affect the temperatures of their surroundings. How cities affect the precipitation

patterns is shown —— and the effect on wind is also described. The "planned city" will force decisions on alternatives of climate and quality of life. The long range effects of the growth of megapolis conclude this film presentation.

USE OF WET COLLECTORS IN CONTROL OF PARTICULATES

B&W, sound, 16MM

PART I - The film shows the operating principles and characteristics of wet collectors. It includes mechanisms of wet collection that influence the collection efficiency and the advantages and disadvantages relative to other collectors.

PART II - This film shows the operating principles and characteristics of fabric filters (baghouses). It includes the construction of a typical baghouse, the design parameters, and their effects on filter operations. The operating parameters and their effects on filter performance and the characteristic advantages and disadvantages relative to other collectors are also shown.

VEHICLE EMISSIONS CONTROL SURVEY

25 minutes, color, sound, 16MM

This film discusses the theory of the formation of photochemical smog, caused by HC and NO_x under sunlight. It shows what the automotive industry has done, and is continuing to do, in the abatement of automotive emissions. Owners of newly purchased cars are advised to keep their vehicles tuned to factory specifications.

YOU AND YOUR FUEL

9 minutes, B&W, sound, 16MM

This film follows coal from the time it is mined until it is burned in a furnace. It describes the analysis which the coal is subjected to including: (1) moisture determinations; (2) percentage of volatile matter gases; (3) percentage of fixed carbon; and (4) ash content. It points out the significance of these tests in assessing the fuel.

When possible, the 69 training films listed on pp. 13 thru 25 will be made available to the Regions upon request. However, the materials are used frequently by the APTI faculty in scheduled air pollution training courses and therefore, are not available on short notice.

Under.normal circumstances, these materials cannot be made available to the general public, because APTI has neither the facilities nor the personnel to operate a loan service.

SUPER 8 MOTION PICTURE
SOUND, TECHNICOLOR CARTRIDGES

"Air Pollution"

"Venturi Scrubbers"

"Smog"

"Cyclone Collectors"

"Electrostatic Precipitators"

"Settling Chambers"

"Fabric Filters"

"The Four Cycle Engine"

"How to Adjust Breaker Points"

"Valve Timing the Four Cycle Engine"

"How to Inspect and Replace Valves"

"Carburetor"

Capsule descriptions of the
12 training aids listed above
are available upon written request.

VIDEO TAPES

The following list is a comprehensive index of Air Pollution Training Institute course presentations which have been recorded on video tape between 1969 and the current year. Many of the instructional presentations were recorded under actual classroom conditions. As a result, technical difficulties were sometimes encountered. Therefore, some video tape presentations may be useful only as reference material. It is suggested that the material be reviewed before any scheduling as educational material is made.

Though much of the material is available in more than one form, this listing describes the original recording only and indicates the type of recorder used for recording, using the following abbreviations:

PN - Panasonic
SY - Sony
IR - IVC or RCA

INDEX OF VIDEO TAPES CONTAINING APTI COURSE MATERIAL

Subject Matter	Instructor	Type Recorder
Control of Automotive Emissions/ Transportation Systems	I. Krese	IR
Control Regulations	C. D. Pratt	IR
Elements of an Air Pollution Control Program	C. D. Pratt	IR
Control of Particulate Emissions	J. D. Sickles (2 tapes)	IR
Control of Gaseous Emissions	J. D. Sickles	IR
Absorption Principles	J. D. Sickles	IR
Control of Automotive Emissions	W. F. Todd	IR
Source Sampling	B. DeWees	IR
Influence of Topography on the Circulation of Air	K. J. Zeller	IR
Interferences in Atomic Absorption	H. Kahn (Perkin-Elmer Corp.)	IR
Flameless Sampling for Atomic Absorption	H. Kahn (Perkin-Elmer Corp.)	IR
Wet Collector Theory and Applications	R. A. Herrick	IR
Fabric Filtration Applications	R. A. Herrick	IR
SAROAD System - Retrieval Capability National Aerometric Data Bank	J. Nehls/C. Chamblee (2 tapes)	IR
Vehicular Emissions	W. Linville (3 tapes)	PN
Development of Diffusion Equations	I. Van der Hoven	SY
Removal of Sulfur Oxides from the Atmosphere	D. Bienstock	IR
Continuous Monitoring for Sulfur Compounds Using the G.C. Analyzer	J. Mulik	SY
Sources and Effects of Organic Pollutants	G. Stoner	IR
Applications of Fabric Filtration	L. Dickey	IR

Subject Matter	Instructor	Type Recorder
Wet Scrubbers	L. Dickey	IR
How to Act as an Expert Witness	H. Bradley	IR
Legal Aspects of Air Pollution	H. Bradley	IR
Control of Odors	A. Turk (2 tapes)	IR
Applications in Absorption	J. W. McDonald (2 tapes)	IR
Case Histories - Complaint Investigations	C. W. Gruber	IR
Engineering Safety Equipment and Procedures	J. Rhom	SY
Simulation Games - News broadcast, editorials, state pollution control office routine, county hearing	Si Baruch (Coordinator) (4 tapes)	PN
Simulation Games - Courtroom Air Pollution Control vs. Industry	D. Nelson (Coordinator) (5 tapes)	PN
Control Strategy Development-Land-Use Aspects of Air Quality Research Transportation Control	John Robeson Dave Tamny (2 tapes)	IR
Federal Methods for Determination of Hydrocarbons Corrected for Methane	Stan Coloff	IR
Meteorological Scales of Motion, Solar Radiation, and General Circulation	J. L. Dicke	IR
Atmospheric Stability & Its Analysis	J. L. Dicke	IR
Natural Removal Processes in the Atmosphere	J. L. Dicke	IR
Effects of Meteorological Parameters on Transport & Dispersion	J. L. Dicke	IR
Plume Behavior and Pollutant Concentration Variations	J. L. Dicke	IR
Implementation Plans	J. L. Dicke	IR
Atmospheric Dispersion and Air Pollution Control	J. L. Dicke	IR
Meteorological Roses	J. L. Dicke	IR

Subject Matter	Instructor	Type Recorder
Diffusion of Air Pollution - Theory & Application		
Turbulence & Diffusion I, II, III	H. A. Panofsky (3 tapes)	IR
Analysis of book "Plume Rise"	G. Briggs (author)	IR
Elements of Diffusion Climatology	G. C. Holzworth	IR
A Generalized Urban Diffusion Model	G. C. Holzworth	IR
Role of the NOAA Environmental Meteorology Support Units	B. L. Sylvern	IR
Geophysical Consequences of Air Pollution	L. Machta	IR
Meteorological Instrumentation in Air Pollution		
Secondary Meteorological Parameters and Measurement	D. Mazzarella	IR
Dynamic Response of Meteorological Recorders	G. C. Gill (2 tapes)	IR
Data Recording Instrumentation	D. Mazzarella	IR
Introduction to Dynamic Response of Meteorological Sensors & Recorders	G. C. Gill	IR
Telemetering Systems	C. W. Barbour (2 tapes)	IR
Gas Chromatographic Analysis of Air Pollutants		
Nomenclature & Chromatographic Systems	H. M. McNair	PN
Basic Theory of Chromatography	H. M. McNair	PN
Detectors-Thermal Conductivity & Flame Ionization	H. M. McNair (2 tapes)	PN
Types & Parameters of G. C. Columns	K. Billeb	PN
Columns Supports & Substrates	K. Billeb	PN
Preparation Techniques	K. Billeb	PN
Qualitative Analysis	G. R. Umbreit	PN
Quantitative Analysis	G. R. Umbreit	PN
Chromatogram Interpretation	G. R. Umbreit	PN
Airborne Particulate Analysis	G. R. Umbreit	PN

Subject Matter	Instructor	Type Recorder
Gaseous Hydrocarbons & Their Derivatives	G. R. Umbreit	PN
Sulfur, Nitrogen, Carbon Derivatives	G. R. Umbreit (2 tapes)	PN
Trouble Shooting G. C. Systems	W. McCann	PN
Principles and Practice of Air Pollution Control		
Course Introduction & Objectives Standards & Criteria	A. H. Campbell	IR
Implementation Plans	J. L. Dicke	IR
Surveillance Networks	K. J. Zobel	IR
Sampling for Particulates	K. J. Zobel	IR
Factors Affecting Pollutant Dispersion	J. L. Dicke	IR
Sampling for Gases	K. J. Zobel	IR
Reading Visible Emissions	A. H. Campbell	IR
Wind and Air Pollution Roses	J. L. Dicke	IR
Influence of Topography	J. L. Dicke	IR
Meteorological Instrumentation and Exposure	J. L. Dicke	IR
Selected Methods: NO_2, O_3, CO, SO_2, & HC	K. J. Zobel (2 tapes)	IR
Common Law, Statutory Law, and Administrative Procedures in Air Pollution Control	A. H. Campbell (2 tapes)	IR
Legal Aspects of Visible Emissions	A. H. Campbell	IR
Air Pollution Climatology & Forecasting	J. L. Dicke	IR
The Role of the Inspector in the Agency	A. H. Campbell	IR
Handling Complaints	A. H. Campbell	IR
Engineering - Control of Gaseous Emissions	D. J. Grove (2 tapes)	IR
Engineering - Control of Particulate Emissions	D. J. Grove	IR
Source Sampling & Evaluation	D. J. Grove (2 tapes)	IR
Transportation Planning	I. Krese	IR

Subject Matter	Instructor	Type Recorder
Control of Automotive Emissions	D. J. Grove	IR
Odor Measurement & Control	D. J. Grove	IR
Atmospheric Dispersion & Air Pollution Control	J. L. Dicke	IR
Introduction to Strategy Training Model	C. D. Pratt	IR
Calibration of Particulate & Gaseous Sampling Equipment	K. J. Zobel	IR
Emergency Episodes	J. L. Dicke	IR
Management Systems	C. D. Pratt	IR
STEP Exercises - Courtroom Simulation	C. D. Pratt	IR
Statewide Survey of Air Pollution Damage to Vegetation		
Introduction	N. Lacasse	PN
Sources of Air Pollution Damage to Vegetation	L. Byers	PN
Methods of Assessing Air Pollution Damage to Vegetation	T. Waddell	PN
Recognition of Air Pollution Damage to Vegetation by Fluorides & Similar Symptoms	M. Treshow (2 tapes)	PN
Recognition of Air Pollution Damage to Vegetation by Sulfur Dioxide & Similar Symptoms	S. Linzon (2 tapes)	PN
Recognition of Air Pollution Damage to Vegetation by Oxidants & Similar Symptoms	O. C. Taylor (2 tapes)	PN
Recognition of Air Pollution Damage to Vegetation by Other Pollutants & Similar Symptoms	W. Heck (2 tapes)	PN
Effects of Particulates on Vegetation	E. Darley	PN
Problems of Diagnosis of Plant Injury from Pesticides, Salinity & Other Chemicals	H. Cole	PN
Meteorological Factors Influencing Air Pollution Damage to Vegetation	W. J. Moroz	PN

Subject Matter	Instructor	Type Recorder
OTHER TAPES WHICH MAY PROVE VALUABLE AS REFERENCE MATERIAL		
Pararosaniline Method for Determination of SO_2 in Atmosphere (No sound, produced for voice over)	K. J. Zobel	IR
Discussion of legal aspects in air pollution control, citing related experiences in Los Angeles air pollution disputes	M. Weeks (3 tapes)	SY
Administrative Techniques for Urban Planners	G. Hagevik (2 tapes)	IR
Control Strategy Development--Land Use Aspects of Air Quality Research; Transportation Control	J. Robeson (2 tapes) D. Tamny	IR
Federal Methods for Determination of Hydrocarbons Corrected for Methane	S. Coloff	IR
Meteorological Scales of Motion, Solar Radiation, and General Circulation	J. L. Dicke	IR

SLIDE SERIES

"Basic Infrared Spectroscopy" (with audio cassette tape)

"Basic Gas Chromatography" (with audio cassette tape)

"Advanced Gas Chromatography" (with audio cassette tape)

"Atomic Absorption Spectroscopy" (with audio cassette tape)

"Basic Liquid Chromatography" (with audio cassette tape)

"Basic Mass Spectroscopy" (with audio cassette tape)

"Air Pollution Effects on Man's Respiratory System" (with audio cassette tape)

"Particulate Sampling" (with audio cassette tape)

"Meteorological Instrumentation" (with audio cassette tape)

"Effects on Vegetation" (with audio cassette tape)

"Control of Mobile Sources" (with audio cassette tape)

"Gaseous Control Equipment" (with manual)

"Vehicle Emission Control" (with manual)

"Visible Emissions"

AUDIO CASSETTE TAPES

Single Tapes

"Control of Particulate Emissions--Particle Sizing"
R. P. Dennis, February 12, 1973

Seminar--"Gathering and Presentation of Support Data"
T. Truitt, April 19, 1972

"Particle Sizing"
F. N. Hill, November 16, 1972

"Field Enforcement During Air Pollution Episodes"
J. Bramblett, September 6, 1972

"Odor and Odor Control"
C. W. Gruber, September 7, 1972

"Source Sampling #450"
J. Grove, W. Smith, June 27, 1972

"SO_2 Determination by West-Gaeke Method"
P. West, September 5, 1972

"Control of Particulates--Asphalt Batching Plants"
W. Linna, City of Chicago, Department of Environmental Control, April, 1970

"Field Enforcement #444", October, 1970

"Plant Survey", J. K. Hambright
"Administrative Procedures", R. D. Aubert
"Handling Complaints", C. W. Gruber
"Odor and Odor Control", J. K. Hambright
"Common Law and Statutory Law", R. D. Aubert

"Combustion Testing Methods"
National Fuel Oil Institute

"Air Monitoring"
Chicago Area Consortium, Tele-Lecture, February, 1972

Seminar--"Particulates in the Urban Atmosphere"
F. Crosby

Legal Seminar
State of Ohio, September, 1972

"Air Pollution and the Law"
S. Plager, Chicago Area Consortium, Tele-Lecture, December, 1971

Tapes with Manuals

"Gel Permeation Chromatography"
J. Cazes

"Ion Selective Membrane Electrodes"
G. A. Rechnitz

"Interpretation of Infrared Spectra"
N. B. Colthup

"Zeolitic Molecular Sieves"
G. Kerr

Tape Series

"Men and Molecules--The Unique ACS Radio Series"

"The Atomic World of Glenn Seaborg", G. Seaborg
"The Committed Scientist", L. Pauling
"The Troubles with Water", D. Okun
"New Weapons Against Insects", G. Stall and J. Siddall
"The Search for Significance", M. Calvin
"The Fusion Torch", B. Eastland and W. Gough
"Fusion and Fission: An Appraisal", J. L. Tuck
"Insects: The Elements of Change", C. M. Williams
"The Lead Issue", M. Mayrsohn and M. H. Hyman
"Bubble Machines and Pollution Finders", K. Patel and L. Kreuzer
"Mercury: Another Look, Part I & II", J. Wood

"American Association for the Advancement of Science", Meeting, Chicago, Illinois, December 1970

"Environmental Impact of a Growing Population"

"Turning Pollution into a Resource"
"Redirecting Society's Growth Patterns"
"Technology and Design for New Cities and New Towns"
"Human Design and Social Innovations"

"Industrial Approaches to Urban Problems"

"Housing and Solid Waste Management"
"Education and Transportation"

"Public Policy for the Environment"

"Automobile Pollution"

"Economics of Pollution"

"Is There a Generation Gap in Science"

"Science Education in the Seventies"

"Is Population Growth Responsible for Environmental Crisis in U.S."

"Chemistry Instruction and Social Concern"
(Sessions I and II)

"Basic Computer Training", with manual
Self-Instructional Development Corporation

"LSU Annual International Symposium on Modern Methods of Analytical Chemistry", January 8-11, 1973

"Measurement Techniques for Implementation of Air Quality Standards", A. P. Altshuller

"Determination of Sulfur in Particulate Samples by GC Methods", M. F. Burke

"Determination of Trace Metals in Particulates by AA and Anodic Stripping", M. F. Burke

"Organization of an Interdisciplinary Research Project on Environmental Effects of a Pollutant", H. A. Laitinen

"The Role of Analytical Chemistry in Environmental Science", H. A. Laitinen

"Size-Selective Air Sampling--The Jet Filter", J. O. Ledbetter

"Can We Afford Zero Pollution Risk?", J. O. Ledbetter

"Characterization and Identification of Atmospheric Particles: Part I, Light Microscopy; Part II, Electron Optical Techniques", W. C. McCrone

"Accuracy and Sensitivity: Fact and Fiction in Air Quality Measurements", W. W. Meinke

"Problems in Methods of Sampling and Analysis", J. L. Monkman

"Development and Implementation of the Environmental Protection Agency's Quality Assurance Program", G. B. Morgan

"Multi-Element Trace Analysis in the Study of the Environment", G. Morrison

"Direct Determination of Metals in Air", J. W. Robinson

"Laser-IR Remote Sensing Device", J. W. Robinson

"The Determination of Sulfur Dioxide and Sulfuric Acid Aerosol", P. W. West

"Determination of Toxic and Carcinogenic Airborne Particulates", P. W. West

GAMES/SIMULATIONS

"Strategy Effectiveness Model" "River Basin Model"

"APEX" "Control Equipment Design and Analysis" (CEDA)

PROGRAMMED TEXTS

Principles of Combustion

Using a Pitot Tube, M. A. Sayland, Textile Fibers Department, E. I. DuPont De Nemours and Company

How the Internal Combustion Engine Operates, Forest H. Watson, E. I. DuPont De Nemours and Company

SELF-INSTRUCTIONAL MATERIALS

Practical Mathematics for Science Students

Determining Significant Figures
803 - Part 1 - with slides and workbook

Precision and Accuracy
803 - Part 2 - with slides and workbook

Solving Simple Equations--Linear and Simultaneous
805 - Part 1 - with slides and workbook

Solving Simple Equations--Quadratic
805 - Part 2 - with slides and workbook

Collecting and Plotting Data, Linear Graphs
806 - with slides and workbook

Collecting and Plotting Data, Non-Linear Graphs
807 - with slides and workbook

Lab Techniques Series

Common Laboratory Apparatus
811 - with slides and workbook

Pipetting Techniques
812 - with slides and workbook

Stoichiometry Series

Atomic Weights, Molecular Weights and Molecular Concept
831 - with slides and workbook

Calculations Involving Equations
834 - with slides and workbook

GUEST SPEAKERS

#411 Air Pollution Meteorology

John Clarke
G. C. Holzworth
Charles R. Hosler
Russ Lee
Emerico Martinez
L. E. Niemeyer
Francis Poller, Jr.

Meteorology Laboratory
Environmental Protection Agency
Research Triangle Park
North Carolina 27711

#413 Control of Particulate Emissions

Richard P. Dennis
G. C. A. Technology Division
G. C. A. Corporation
Pollution Control Laboratory
Burlington Road
Bedford, Massachusetts 01730

Heinz L. Engelbrecht
Wheelabrator-Frye, Inc.
Air Pollution Control Systems
930 Ft. Duquesne Blvd.
Pittsburgh, Pennsylvania 15222

Robert A. Herrick
Director, Environmental Services Division
General Environments Corporation
6840 Industrial Road
Springfield, Virginia 22151

#415 Control of Gaseous Emissions

C. W. Gruber
University of Cincinnati
6309 Parkman Place
Cincinnati, Ohio 45213

J. L. Kovach
Director of Research
North American Carbon
Post Office Box [illegible]737
Columbus, Ohio [illegible]219

J. W. MacDonald
Design Engineer
Ceilcote Corporation
140 Shelton Road
Berea, Ohio 44017

A. Turk, Ph.D.
Consulting Chemist
7 Tarrywile Lake Drive
Danbury, Connecticut 06810

#423 Diffusion of Air Pollution--Theory and Application

G. A. Briggs, Ph.D.
ATDL-NOAA
Post Office Box E
Oak Ridge, Tennessee 37830

A. D. Busse
D. H. Coventry
G. C. Holzworth
Charles R. Hosler
R. I. Larsen
W. H. Snyder
D. B. Turner
H. J. Viebrock

Meteorology Laboratory
Environmental Protection Agency
Research Triangle Park
North Carolina 27711

#426 Statistical Evaluation of Air Pollution Data

Gerald G. Akland
Quality Assurance and Environmental Monitoring Laboratory
Environmental Protection Agency
Research Triangle Park, North Carolina 27711

William F. Hunt, Jr.
Monitoring and Data Analysis Division
Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Maureen M. Johnson
Data Systems Division
Environmental Protection Agency
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Lawrence L. Kupper
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Chapel Hill, North Carolina 27514

David K. Lowell
Manager, Hybrid Computer Lab
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1600 Patterson Street
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Marsha Williams
Statistician
Inspection and Surveillance Branch
Mobile Sources Pollution Control Program
Environmental Protection Agency
2565 Plymouth Road
Ann Arbor, Michigan

John Wood
Texas State Department of Health
Air Pollution Control Services
1100 West 49th Street
Austin, Texas 78756

#427 Combustion Evaluation

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