United States
Environmental Protection
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Control Technology Center

EPA

CONTROL TECHNOLOGY CENTER PROGRAM OPERATING MANUAL

control technology center

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PROGRAM OPERATING MANUAL

Sponsored By:

Emission Standards Division
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Air and Energy Engineering Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

CONTROL TECHNOLOGY CENTER

PROGRAM OPERATING MANUAL

by

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Control Technology Center
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

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1.0 INTRODUCTION

The Control Technology Center (CTC) Program Operating Manual provides information about and standard operating procedures of the Center. It outlines the Center's organizational structure, project funding and completion procedures, and administrative requirements. The CTC Manual is a reference for CTC Steering Committee (SC) members, individuals requiring information about the CTC, the CTC staff, and others conducting CTC business. Portions of this Manual are a guide for EPA staff in answering the CTC HOTLINE or coordinating CTC projects. The manual also provides information on CTC projects and other program functions.

The CTC updates the Manual periodically as it defines and modifies policies, and as it initiates, develops, and completes projects. The Center revises some material in the Manual as that material becomes outdated, or as new information becomes available. The page-numbering system allows for deletion and insertion of pages as these changes occur. The first digit of each page number denotes the page's section. The last digit reflects its sequence in the section. The CTC program staff sends revisions to Manual users with instructions for replacement of outdated pages. The CTC may distribute a single section as "stand-alone" text to any individual requiring information on a certain aspect of the CTC.

1.1 BACKGROUND

In June 1985, the U.S. Environmental Protection Agency (EPA) announced an Air Toxics Strategy to reduce public exposure to toxic pollutants in the ambient air. The Strategy addressed concerns about both routine and accidental releases. It coupled the responsibilities of traditional Federal regulatory programs, such as the National Emission Standards for Hazardous Air Pollutants (NESHAPs) and New Source Performance Standards (NSPS), with State and local regulatory responsibilities. The Strategy called for State and local authorities to take on an additional regulatory role with EPA's technical and financial assistance. As a result, EPA's 5-year Air Toxics Implementation Plan identified the enhancement of State and local air toxics programs as a key component of the Agency's Strategy.

The shift of the regulatory role toward State and local air toxics programs required these programs to assume new responsibilities. The change in roles required the transfer of expertise from the Federal to the State and local level. In response to that requirement, EPA's Office of Research and Development (ORD) and Office of Air Quality Planning and Standards (OAQPS) implemented an innovative technical assistance program. That program, the Control Technology Center (CTC), is part of EPA's Air Toxics Implementation Plan. The plan called for assistance to State and local air pollution agencies and EPA Regional Offices.

The Center became a collaborative effort between OAQPS' Emission Standards Division (ESD), and ORD's Air and Energy Engineering Research Laboratory (AEERL). The Center for Environmental Research Information (CERI) also played a key role in the CTC's development and continues its involvement through representation on the CTC SC. The CTC soon realized the need for technical support in areas other than air toxics. It, therefore, expanded its scope to include criteria pollutants (oxides of nitrogen and sulfur, lead, particulates, carbon monoxide, and ozone) and non-criteria pollutants. The expansion was relatively simple, because the necessary expertise was already available within the participating organizations.

The Clean Air Act Amendments (CAAA) of 1990 have further expanded the CTC's clientele and the Center's requirement to provide technical assistance. Title III of the Amendments requires EPA to provide technical support not only to State and local governmental agencies, but also to all non-governmental requestors on a cost-reimbursable basis. In addition, Title V of the Amendments calls for the establishment of a small business stationary source technical and environmental

compliance assistance program. The CTC will play a major role in implementing the technical assistance portion of this program.

The CTC is not EPA's only technical assistance effort for State and local agencies in the area of air toxics. However, the Center is designed to be flexible. Thus, it can respond quickly to the needs of State and local air pollution agencies for emissions assessment, control technology, and source test methods.

1.2 FORMATION AND ORGANIZATION

Representatives of OAQPS, AEERL, and CERI met in early 1987, to discuss the CTC concept. They agreed to form a SC to provide direction for the program. The lead organizations chose SC members from the three groups' management staffs. The SC-appointed Chair and Chair-designate positions (referred to as the CTC Co-chairs) rotate annually between AEERL and OAQPS. The Co-chairs represent OAQPS' Emission Standards Division (ESD) and the Organics Control Branch of AEERL's Global Emissions and Control Division (GECD). The Co-chairs work with the staffs of ORD and OAQPS and access contractor support to accomplish the CTC's goals.

The SC recognized the need for close interaction among the CTC and State and local air toxics program staffs. So, the CTC established the Advisory Work Group to work with the SC and the Co-chairs. The Group ensures that the CTC effectively addresses the needs of State and local air toxics programs. Members of this group include State and local agency personnel and an air program representative from an EPA Regional Office. Figure 1-1 is a block diagram of the CTC's functional structure.

The CTC SC made an early key decision to broaden CTC assistance beyond air toxics control issues alone. The Center addresses the control of other air pollutants including criteria pollutants. The SC also realized that air pollution control programs at State and local agencies are interrelated. These programs would not limit their requests of the CTC to just topics concerning the control of air toxics. Thus, the SC opted to be responsive rather than restrictive. The CTC now addresses all emission and control technology concerns identified by State and local air pollution agencies. The program includes emission source and control technology assessments associated with air toxics, particulate matter, oxides of sulfur and nitrogen, volatile organic compounds, lead, and carbon monoxide.

Title III of the CAAA of 1990 requires the CTC to continue its support for State, local, and Federal air pollution control agencies. Title III also requires the CTC to provide similar services to non-governmental agencies on a cost-reimbursable basis. Title V of the Act gave special consideration to small businesses. Thus, the CTC will play a major role in their support. However, the cost-reimbursable requirements for private industry will not apply to small businesses. In response to this requirement, the CTC began logging calls from private industry and providing limited technical services in late 1990. The CTC expects to further expand these activities once it establishes protocol for private and small business assistance and cost-reimbursement.

Another early key decision regarded funding. Although OAQPS and AEERL provide separate funding for CTC activities, they decided to pool resources for allocation by the SC. CERI may also opt to fund CTC projects on a case-by-case basis consistent with its program objectives.

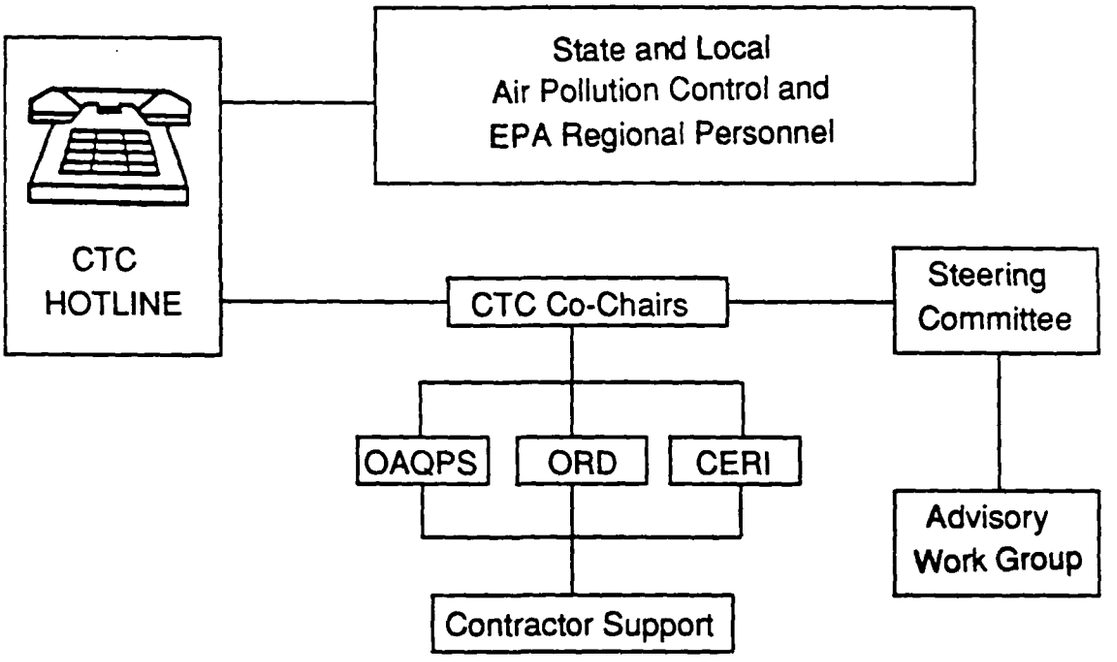

Figure 1-1 CTC Functional Structure

1.3 ASSISTANCE PROVIDED

The CTC provides five types of assistance described as follows:

1. CTC HOTLINE. The CTC HOTLINE is a telephone number for easy access to EPA personnel, who provide prompt assistance in a variety of ways. EPA staff furnish CTC clients with consultations, references to pertinent literature, and access to EPA technical data and analyses. A tracking system ensures that each request receives a prompt response. The CTC strives to provide satisfactory assistance in every case. When no EPA staff or consultant expertise is available in a certain area, the CTC may conduct a literature search or seek assistance from outside sources.

2. Engineering Assistance. Engineering assistance projects are short-term (usually completed within 3 months). Each project provides technical assistance to one State or local agency. Engineering assistance projects are specific in nature and may not be applicable to problems in other locations. These projects result from HOTLINE calls which require in-depth engineering analysis. Engineering assistance projects have included review of control technology applications, plant inspections, and consultation on specific problems.

3. Technical Guidance. Technical guidance projects are generally long-term (usually completed within a year), broad in scope, and of national interest. They may result from a number of HOTLINE calls received on the same source or industry, a joint request from a group of air pollution agencies, or comments and suggestions by the Advisory Work Group. These projects may result in control technology documents, microcomputer software, seminars, or workshops.

4. CTC Bulletin Board. The CTC has established an electronic bulletin board on the OAQPS Technology Transfer Network (TTN). The bulletin board offers direct access to certain CTC documents, software, and HOTLINE-type assistance during non-business hours (before 7:30 am and after 5:00 pm Eastern time). Users may order CTC documents, view "help" and information messages for unique problems, and access CTC project schedules and general communication functions. Anyone with a personal computer equipped with communications software and a modem may access the bulletin board. A user may sign-on to the OAQPS TTN by calling (919) 541-5472 or (FTS) 629-5472 for a modem with a 1200-2400 baud rate, or (919) 541-1447 or (FTS) 629-1447 for modem with a 9600 baud rate. Once signed-on or registered, the user selects a CTC option. (See Appendix A for more information on the CTC bulletin board.)

5. Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate (RACT/BACT/LAER) Clearinghouse. The OAQPS component of the CTC operates and maintains the RACT/BACT/LAER Clearinghouse. The Clearinghouse provides summary information on RACT, BACT, and LAER determinations resulting from non-attainment State Implementation Plan, prevention of significant air quality deterioration, and new source review permitting actions. Appendix B provides details on direct access to the Clearinghouse data base.

2.0 THE CONTROL TECHNOLOGY CENTER ORGANIZATION

The Office of Air Quality Planning and Standards (OAQPS) and The Air and Energy Environmental Research Laboratory (AEERL) jointly operate and fund the Control Technology Center (CTC). The Center for Environmental Research Information (CERI) in Cincinnati, Ohio, also provides material support to the CTC and is represented by a voting member on the CTC Steering Committee (SC).

The CTC is a matrix managed program drawing from the combined expertise of the program offices and contractor personnel. Co-chairs from the supporting organizations manage the CTC with program direction from the SC. The State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO) have established an external Advisory Work Group. The Work Group coordinates the CTC with State and local agencies on the agencies' technical support requirements.

The following describe the CTC's basic organizational components and their functions.

1. The CTC Steering Committee. The Steering Committee (SC) consists of 12 representatives of the EPA organizations that sponsor the CTC. The SC provides the CTC with general guidance and direction. It meets monthly to address the CTC budget, the status of current projects, and potential projects. The meetings provide an opportunity for members to discuss and determine the merits of potential projects according to established guidelines. The SC provides technical, budgeting, and scheduling guidance for each project that it funds. The line managers of each organization, the CTC Co-chairs, ensure that CTC activities comply with the SC's guidelines. The Co-chairs also ensure the quality of work performed for the CTC.

2. The Advisory Work Group. The STAPPA/ALAPCO select and comprise the membership of the CTC Advisory Work Group. The Group meets with SC members and the Co-chairs once or twice a year. The meetings inform the Work Group of current CTC activities and permit discussion of issues requiring this special group's guidance. The Work Group provides valuable input to help the CTC most efficiently meet the needs of State and local agencies.

3. The CTC Co-chairs. The Co-chairs, representing OAQPS and ORD, manage the CTC's day-to-day operation. They, or their designees, are the client's first contact with the CTC via the HOTLINE. The Co-chairs' basic functions are to:

   a. Work with the managers in their respective organizations to select technical personnel best qualified to respond to each request.

   b. Track the status of each project in their respective organizations and inform the SC of each project's progress.

   c. Work with technical personnel to ensure that each project is within the CTC's technical, budgeting, and scheduling guidelines.

4. CTC Program Staff. The CTC program staff supports the goals of the CTC and provides administrative and technical assistance to the Co-chairs. This support includes (but is not limited to) HOTLINE coverage, data base management, and technical analysis within the staff's respective areas of expertise.

3.0 CTC ORGANIZATIONAL PROTOCOL AND OPERATING PROCEDURES

This section defines the guidelines for the Control Technology Center's (CTC's) operation and structure. Subsection 3.1 outlines the program's general operating protocol and philosophies. Succeeding subsections provide operating procedures for adherence to specific guidelines.

3.1 GENERAL OPERATING PROTOCOL

1. The CTC is a cooperative effort between the Office of Air Quality Planning and Standards (OAQPS) and the Office of Research and Development (ORD). The Center for Environmental Research Institute (CERI) provides technology transfer support in some cases.

2. The Steering Committee (SC), comprised of personnel from OAQPS, AEERL, and CERI, directs the CTC. The SC includes:

   a. Six permanent members from ESD including the Co-chair

   b. Five permanent members from AEERL including the Co-chair, and

   c. One permanent member from CERI.

3. The SC designates a Co-chair from each organization. The Committee Chair rotates on a fiscal year basis between OAQPS' Emissions Standards Division (ESD) and AEERL's Global Emissions Control Division (GECD). The lead Co-chair takes on the Chair position at the beginning of each new fiscal year and serves for one year. The Co-chairs conduct SC meetings and help implement the SC's decisions. The Co-chairs also coordinate CTC work within their respective organizations to ensure the accomplishment of the CTC's goals.

4. The Co-chairs track the status of projects in their respective organizations and ensure that the projects are within the technical, budgeting, and scheduling guidelines established by the SC.

5. The Co-chairs track the funds which OAQPS and AEERL allocate for the CTC budget. The SC has full responsibility for determining the use of these pooled resources. The CTC budget does not fund supplies, equipment, or Full-time Equivalent (FTE) salaries.

6. Any SC member may propose modification of CTC operating procedures at a regularly scheduled SC meeting. At the next scheduled SC meeting it takes at least a two-thirds majority of attending members to approve the modification.

3.2 CTC PROJECT APPROVAL AND SELECTION GUIDELINES

The CTC ranks projects for funding approval according to the following criteria:

1. The needs identified by State and local agencies (as opposed to the CTC's perception of their needs)

2. The problem's urgency as perceived by the State or local agency

3. The expertise available to provide a useful product

4. The product's applicability to other State and local jurisdictions

5. The resource investment compared with the product's value

6. The project's cost compared with the available funds

7. The work's relationship to other ongoing projects within EPA (e.g., the potential to combine with or extend the work of other projects)

Upon approval of a project, the Center follows a series of events coordinated among individual offices for the successful completion of a project. These events ensure that each project follows development and review protocol. Each CTC management level is involved in the production of a CTC project. When the Co-chairs receive a project request, they evaluate its background before submitting it to the SC for approval and funding. The Co-chairs select the appropriate personnel to lead the project and serve as team members. The team leader and the Co-chairs are responsible for producing a document that satisfies the objectives of the technical request. Figure 3-1 depicts the sequence of events in completing a CTC project.

The Co-chairs establish a project team for each technical guidance and engineering assistance project. The Co-chairs designate a project leader from the lead organization and team members from other organizations. The project leader consults with team members in planning the project and making key decisions to ensure that the project is cooperative effort. The project leader is responsible for informing team members of pertinent meetings and the project's status, and allows them to review all draft and final reports.

Occasionally, State, local, or Federal agency personnel requesting CTC assistance cooperate with CTC project teams. Cooperating personnel may review the work plan to ensure that the project will meet their needs. Requesting agency personnel also review the resulting report. The CTC encourages participation by requesting agency personnel as appropriate and as time allows.

The CTC issues reports upon the concurrence of all team members involved in conducting the work and the respective organization directors; i.e., ESD and AEERL directors.

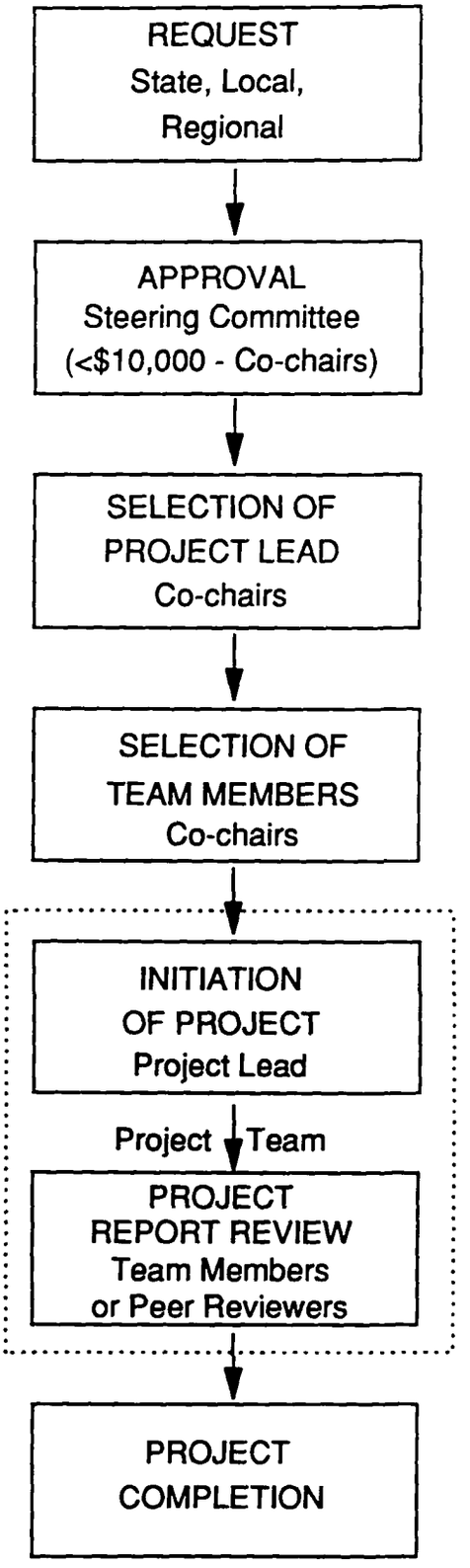

Figure 3-1 Sequence of Events in Completing a CTC Project

3.3 PROJECT FUNDING

The following are the SC's and Co-chair's guidelines for approving CTC projects and additional funding:

1. The CTC Co-chairs may approve projects costing $10,000 or less without consulting the SC. Either a team or an individual may conduct Co-chair approved projects at the Co-chairs' discretion.

2. The Co-chairs may approve up to $2,000 in additional funding for projects originally funded at $10,000 or less. The SC may approve funding overruns causing a project originally funded at $10,000 or less to exceed a total cost of $12,000.

3. The SC approves projects initially requiring more than $10,000 of CTC funding.

4. The Co-chairs may approve additional project costs of up to 20 percent of a project's original funding. The SC concurs on all cost overruns exceeding 20 percent of the original project funding.

3.4 PROJECT LEADERS AND TEAMS

3.4.1 The CTC Co-chairs

The CTC Co-chairs identify and assign a project leader and team members to conduct each project. The project leader is responsible for the management and technical progress of the project.

The roles of the Co-chairs, project leaders, and team members in conducting projects are as follows:

1. A project team, including personnel from ESD and AEERL, conducts each project.

2. The Co-chairs designate the lead organization for each project. The line manager of the lead organization recommends a staff member to lead the project. The Co-chairs assist the lead organization in selecting the project leader and must concur with the selection.

3. The Co-chairs provide technical, budgeting, and scheduling guidance for each project. The line managers ensure that projects follow established guidelines and ensure the quality of work performed.

4. The Co-chairs provide frequent status reports on the projects that their respective organizations lead.

3.4.2 AP-42 Interface

The CTC often conducts projects which result in improved estimation methods or emission factors for a particular source category or process. EPA publication AP-42, "Compilation of Air Pollution Emission Factors" and its associated documents and data systems are EPA's official source of emission factors for criteria and toxic pollutants. Therefore, the CTC tries to coordinate the collection of any advances in the state-of-the-art emission estimates with these documents and systems. Thus, the CTC requests that project leaders include in a contract's scope of work (1) that AP-42 and associated air toxics documents be reviewed to determine that data developed for future updates are current and appropriate; (2) specific recommendations on what testing would be required for proper delineation of the emissions; and (3) specific recommendations on areas that should be updated in these reports.

If possible, in the same task, the project leader should contact OAQPS/Technical Support Division's Emission Factor and Methodologies Section (EFMS). The project leader should explore the feasibility of having the contractor prepare these updates for the source category under the same contract. He should also determine if EFMS will be required and able to provide supplemental funding.

3.5 PROJECT TRACKING

The CTC Co-chairs track current CTC projects to monitor their progress and ensure that the projects are meeting scheduling and budgeting guidelines. A report is provided to the Steering Committee and the Advisory Work Group each month on the status of CTC projects.

3.5.1 Project Tracking Form

Every month the CTC sends the previous month's Project Tracking Form (Figure 3-2) for each project to the project leader. The project leader updates the form and submits it to the CTC Co-chair in his organization by the 25th of each month.

The Project Tracking form is similar to OAQPS/ESD's Project Milestone Report (PMR). However, the CTC form requires different information at the top, which it uses to identify projects for CTC tracking. ESD staff members who routinely submit PMRs for ESD tracking, may submit those forms with the CTC information block attached instead of CTC forms.

The CTC provides project leaders with the following guidelines for completing project tracking forms:

1. Print the requested information on the form. The information will be entered onto a computer form for distribution to Steering Committee and Advisory Work Group members.

2. Complete the schedule on the first page as follows:

   a. Under ACTIVITY, list major project milestones or deliverables. The first three activities should be (1) "Approval by CTC Steering Committee" (2) "Work Assignment completion," and (3) "Work Assignment issuance by the Contracts Office"

   b. Indicate in the next column each activity's original completion date.

   c. If the project schedule changes, enter the revised schedule in the next available column under "CURRENT PROJECTED DATE." On the top line of each column enter the date of the schedule change.

   d. Enter the actual completion date of each in the last column

3. Briefly summarize the purpose and goals of the project in the PROJECT DESCRIPTION block on the back of the form.

4. In the PROJECT STATUS section, enter a brief narrative (two or three sentences) on the project's progress during the month. Include expected budget increases and problems or issues that caused a change in the project's schedule. Indicate the date of the narrative in the left hand column.

5. Submit the form to your immediate supervisor, who initials both sides of the form in the spaces provided to indicate concurrence.

6. Deliver the completed form to the appropriate CTC Co-chair by the 25th of the month.

CTC PROJECT TRACKING FORM

TITLE_____ CTC NUMBER_____

WORK ASSIGNMENT NUMBER_____ CONTRACT NUMBER_____

PROJECT LEADER_____ REPORT DATE_____

PROJECT START DATE_____ CONTRACTOR_____
Firm/Project Leader

SUPERVISOR'S INITIALS_____ CTC CO-CHAIR INITIALS (DARVIN/BLASZCZAK)_____

ACTIVITY	ORIGINAL PROJECTED DATE (MM/DD/YY)		CURRENT PROJECTED DATE (MM/DD/YY)	(MM/DD/YY)	ACTUAL DATE (MM/DD/YY)
1. Steering Committee approval					
2.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					

(Continued)

Figure 3-2 Sample Project Tracking Form

MONTHLY PROJECT NARRATIVE

TITLE_____ CTC No._____ DATE_____

SUPERVISOR'S INITIALS_____CTC CO-CHAIR INITIALS (DARVIN/BLASZCZAK)_____

PROJECT DESCRIPTION:

DATE OF REPORT	PROJECT STATUS

Figure 3-2 Sample Project Tracking Form (Continued)

3.6 INFORMATION TRANSFER POLICY

Information transfer, as it relates to air emissions and air pollution control technology, is a CTC function. The purposes of information transfer are:

1. To provide State and local agencies and other CTC clients with state-of-the-art information on emissions, emission control technologies, and other related technical issues; and

2. To assist State and local agencies in implementing air pollution control programs in other ways consistent with the CTC's mission and available expertise.

The method of delivering information developed by the CTC depends on several factors. Those factors include the nature of the information, the urgency of the need, the number of individuals requiring the information, and its long-term value to State and local agencies. Methods of delivery may include published documents, workshops, seminars, computer software, training courses, and other media.

The Air Pollution Training Institute (APTI) is responsible for establishing and delivering training programs. The CTC does not overlap or duplicate that responsibility. However, the CTC may assist APTI in developing new training courses under the following conditions:

1. The request for training course development is initiated by a State or local agency or EPA Regional Office

2. The requested training and relevant training materials are not readily available from any other source

3. The needed training substantially involves air emissions or the application of air pollution control technology

4. The CTC (through OAQPS, AEERL, and supporting contractor staff) has the expertise to develop the needed training course.

5. The CTC will directly participate in developing the requested training course

6. The CTC's role is limited to any one or a combination of the following:

   a. Developing technical information needed to compile the course

   b. Assisting APTI in preparing the course and course material

   c. Conducting pilot training exercises in the subject field to evaluate and refine the training material

7. Once developed, the training course material is turned over to APTI, EPA Regional Offices, or State and local agencies for presentation, promotion, and delivery

8. The CTC does not consider the transfer of its funds to any program or that program's designated contractor, to support an activity that would not involve any other direct CTC participation, to be an appropriate use of CTC resources.

9. The CTC does not fund training courses for State and local agencies that are available through APTI or other training institutions. The CTC does not fund travel or other expenses associated with attendance at CTC-sponsored workshops or seminars.

The recipients of any CTC information may include staff associated with State and local agencies or regulated industries. Information transfer activities targeted for regulated industries may be essential for States or local agencies to achieve their regulatory goals. The CTC will consider requests by State or local agencies or EPA Regional Offices for any such activities under established CTC procedures. The CTC will consider requests from non-governmental requestors on a cost-reimbursable basis only.

4.0 REPORT PREPARATION

The Control Technology Center (CTC) publishes formal reports resulting from the Center's two types of projects—CTC engineering assistance and technical guidance. The organization conducting a study, the Air and Energy Environmental Research Laboratory (AEERL) or the Office of Air Quality Planning and Standards (OAQPS), establishes the protocol for producing the final project report. The following subsections present each organization's procedures for processing CTC project reports.

4.1 REPORT FORMAT

The CTC is a joint program of OAQPS and the Office of Research and Development (ORD). The Center ensures that both organizations cooperate in publishing all reports resulting from CTC projects. Therefore, the directors of AEERL and OAQPS's Emission Standards Division (ESD) concur on all technical guidance reports. The CTC Co-chairs and project team coordinate all engineering assistance projects. The CTC is the sponsoring body of the Center's publications, and provides the following procedures for all CTC reports and papers:

1. Each CTC report bears the standard CTC cover as shown in Figure 4-1. Project leaders may obtain the CTC cover on standard Environmental Protection Agency (EPA) graphics software from the CTC Co-chairs. The CTC Steering Committee (SC) may approve exceptions to cover requirements for projects that the CTC conducts in cooperation with other organizations.

2. The lead organization assigns the EPA project report number.

3. The first page inside the report cover is the title page as shown in Figure 4-2. The standard ORD title page (Figure 4-3) follows the first title page showing the CTC as the publishing organization rather than ORD. When another organization jointly sponsors a project with the CTC, the report does not include the first title page. The report lists the joint sponsor on the standard ORD title page.

4. Each CTC report includes an acknowledgement listing the names and organizations of the report's authors, project leader, and team members. See Figure 4-4.

5. Each CTC report includes a preface which briefly explains the CTC concept. The preface also describes the different types of CTC assistance and the Center's rationale for conducting that project. See Figure 4-5.

United States
Environmental Protection
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Control Technology Center

EPA-600/8-90-085a December 1990

EPA

LANDFILL AIR EMISSIONS ESTIMATION MODEL

USER'S MANUAL

control technology center

Figure 4-1. Sample Standard CTC Report Cover

CONTROL TECHNOLOGY CENTER

Sponsored by:

Emission Standards Division
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Research Triangle Park, NC 27711

Air and Energy Engineering Research Laboratory
Office of Research and Development
U.S.Environmental Protection Agency
Research Triangle Park, NC 27711

Figure 4-2. Sample CTC Report Title Page

EPA-600/8-90-085a
December 1990

LANDFILL AIR EMISSIONS ESTIMATION MODEL

USER'S MANUAL

by:

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Robert L. Bass
Irene R. Kuo
A. L. Blackard
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Post Office Box 13000
Research Triangle Park, NC 27709

EPA Contract 68-02-4286
Work Assignment 48

Project Officer:

Susan A. Thorneloe
Air and Energy Engineering Research Laboratory
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Prepared for:

U. S. Environmental Protection Agency
Office of Research and Development
Washington, D.C. 20460

Figure 4-3. Sample Standard ORD Title Page

ACKNOWLEDGMENT

The author of the program was Robert Bass of Radian Corporation. Also serving on the EPA project team were W. Fred Dimmick and Mark Najarian of the Office of Air Quality Planning and Standards.

Figure 4-4. Sample CTC Report Acknowledgment

PREFACE

The Control Technology Center (CTC) was established by the U.S. Environmental Protection Agency's (EPA's) Office of Research and Development (ORD) and Office of Air Quality Planning and Standards (OAQPS) to provide technical assistance to state and local air pollution control agencies. Three levels of assistance can be accessed through the CTC. First, a CTC HOTLINE has been established to provide telephone assistance on matters relating to air pollution control technology. Second, more in-depth engineering assistance can be provided when appropriate. Third, the CTC can provide technical guidance through publication of technical guidance documents, development of personal computer software, and presentation of workshops on control technology matters.

The personal computer software projects, such as this one, focus on topics of national or regional interest that are identified through contact with state and local agencies. In this case, the CTC became interested in assisting state and local agencies in estimating landfill air emission rates. This interest was prompted by numerous requests for technical assistance from state and local agencies on how to estimate landfill air emissions and guidance on how the gas can be collected and controlled. This interest was also prompted by the upcoming New Source Performance Standard (NSPS) and 111(d) Guidelines for Municipal Solid Waste Landfill Air Emissions, which are expected to be proposed later this year.

This document is a user's guide for the program, "Landfill Air Emissions Estimation Model." This estimation model is based on the Scholl Canyon Gas Generation Model, which was used in the development of the soon-to-be proposed Clean Air Act (CAA) regulations for landfills. The Scholl Canyon model is described in Reference 26. The recommended default values provided in the program as input variables for the Scholl Canyon Model were developed for the draft NSPS and guidelines. These values are based on test data collected for landfill regulation development. Development of these default values is outlined in Reference 20. The test data are summarized in Chapter 3 of Reference 1.

It should be noted that the default input values provided by the program and the user's guide may be revised depending on any future information collected by the Agency.

Figure 4-5. Sample CTC Report Preface

4.2 REPORT PROCESSING

1. Any reviewer with a serious concern about a report notifies the CTC Co-chairs. The Co-chairs work with the team members, the CTC SC, and the appropriate management chain to resolve the issue.

2. The SC may require additional review for a report by an outside organization, such as the National Air Pollution Control Techniques Advisory Committee. The project leader or any SC meeting attendee may propose such additional review. The following procedures for review and approval apply to each CTC report.

3. Review procedures listed in this section do not apply to HOTLINE responses. However, the expert providing a written response to a HOTLINE request should send a copy of the response to the CTC Co-chairs. The Co-chairs must concur on any substantive written response. Any contractor responding to a HOTLINE call must send a copy of the response to the referring EPA staff member. The staff member reviews the information, and, upon finding it acceptable, forwards it to the requestor. A contractor may send the results of a literature search directly to the requestor with confirmation to the CTC Co-chair or HOTLINE assignee. Section 5 lists procedures for processing HOTLINE calls.

4.2.1 REPORT PROCESSING WITH AEERL LEAD

Because of the specific nature of engineering assistance projects, the SC may determine that a formal report is not required. Project leaders from AEERL may refer to the sequence of events, depicted in Figure 4-6, in completing CTC projects. That sequence is described as follows:

1. The contractor prepares a draft report and sends it to the project leader.

2. (a) When the project leader receives the draft report from the contractor, he/she immediately sends copies to the team members. The project leader ensures that team members have sufficient time to review the report. The project leader may stipulate in the work assignment that the contractor send a report directly to the team members.

   After the project leader has reviewed the report, the contractor makes any needed changes. When the changes are complete, the project leader submits the report to AEERL for peer, policy, and editorial review. Team members from AEERL or OAQPS may serve as peer reviewers.

   The CTC monthly project status report notifies the CTC SC when a draft report is available for review. The project leader cooperates fully with SC members who ask to review a report or portion of a report. He/she provides a deadline for comments to team members and others who review a document.

   The project leader drafts a trip report for any project involving assessment of a facility (e.g., a plant visit to collect engineering data). He/she sends the plant copies of the trip report for review. The project leader follows established EPA Confidential Business Information (CBI) procedures for any information that a source designates as CBI. The project may leader contact a CTC Co-chairs for EPA's CBI procedures.

   (b) AEERL's peer, policy, and editorial reviewers send all comments to the project leader.

3. The project leader evaluates the comments and notifies the contractor of changes.

4. The contractor revises the report.

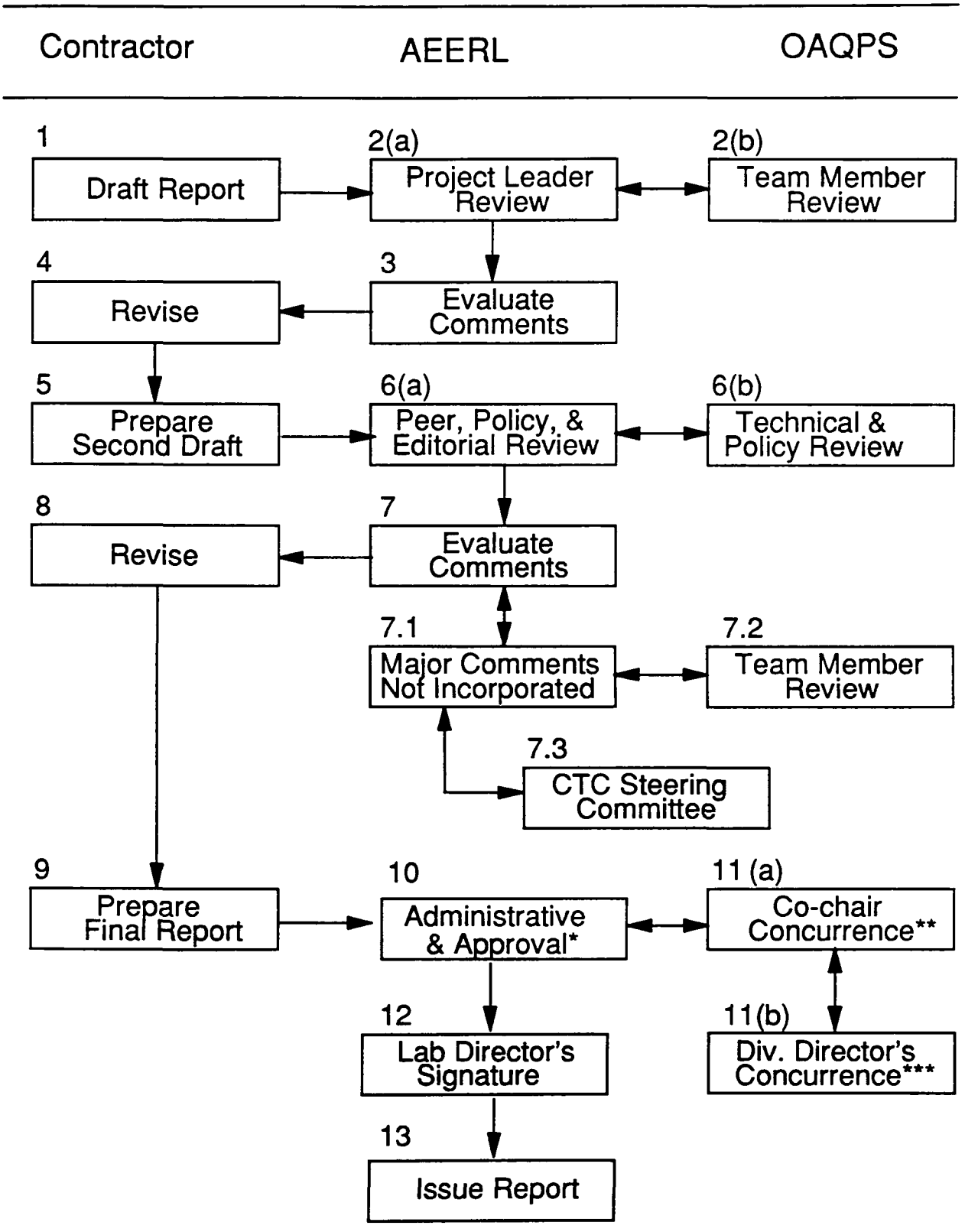
5. The contractor sends the second draft report to the project leader.

6. (a) The project leader reviews the second draft report to ensure that all comments have been satisfactorily addressed.

   (b) The project leader sends the second draft report to the team members providing them with a deadline for submitting any additional comments. The team members ensure that all major technical and policy concerns have been addressed. Team members notify the project leader in writing of any additional changes. Project leaders and team members send copies of all correspondence involving report processing to the CTC Co-chairs. The CTC Co-chairs work with team members and their management chains to resolve any outstanding issues before report publication.

7. After the deadline for comments, the project leader ensures that all issues have been addressed. He/she, then, submits the report for administrative and editorial review.

8. Following administrative and editorial approval, the contractor revises the report for printing.



*Completion of CTC project assignment
**Applies to Technical Guidance Reports only
***Approval for policy and technical acceptance. Does not include format or editorial acceptance.

Figure 4-6 Sequence of Events in Completing CTC Projects for AEERL

9. When the contractor has prepared the final report, the project leader consults the AEERL Co-chair to determine the number of copies to be printed. The project leader sends the AEERL Co-chair a photo-reproducible master of the report, and authorizes printing only with Co-chair approval.

10. The Co-chairs distribute copies of the report to the SC members for final technical and policy review.

11. (a) The AEERL Co-chair sends copies of each technical guidance project report to the OAQPS Co-chair for concurrence and distribution to the ESD director.

    (b) The ESD director concurs on the report.

12. The AEERL Co-chair submits the report to the laboratory director for signature.

13. The CTC issues the report. The AEERL director has authorized printing of up to 150 copies of AEERL-generated CTC reports.

4.2.2 REPORT PROCESSING WITH OAQPS LEAD

Because of the specific nature of engineering assistance projects, the SC may determine that a formal report is not required for that type of project. Project leaders from OAQPS may refer to the sequence of events depicted in Figure 4-7 in completing CTC projects. That sequence is described as follows:

1. The contractor prepares a draft report and sends it to the project leader.

2. (a) When the project leader receives the draft report from the contractor, he/she immediately sends copies to the team members. The project leader ensures that the team members have sufficient time to review the report. The project leader may stipulate in the work assignment that the contractor send the report directly to the team members.

   When the CTC has assigned no AEERL team member, the AEERL Co-chair acts as the AEERL team member for report review. When more than one AEERL team member has been assigned, one team member is responsible for peer, policy, and editorial review.

   The CTC monthly project status report notifies the CTC SC when a draft report is available for review. The project leader cooperates fully with SC members who ask to review a report or portion of a report. The project leader gives team members and all others who review the document a deadline for comments.

   The project leader drafts a trip report for any project involving assessment of a facility (e.g., a plant visit to collect engineering data). He/she sends the plant copies of the trip report for review. The project leader follows established EPA Confidential Business Information (CBI) procedures for any information that a source designates as CBI. The project leader may contact a CTC Co-chair for EPA's CBI procedures.

   (b) AEERL team members review the report for technical accuracy and adherence to agency programs and policies. They send all comments directly to the project leader.

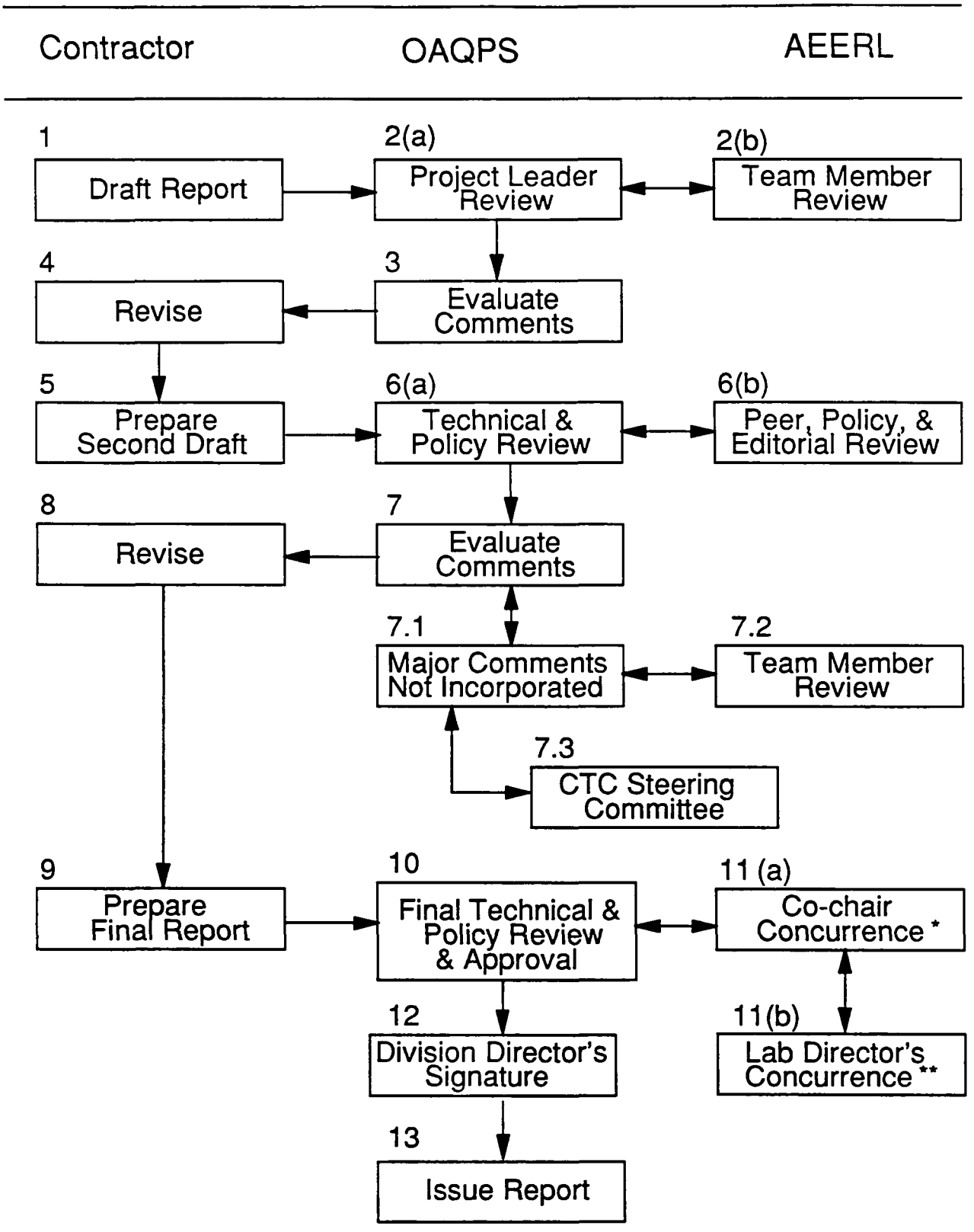
3. The project leader evaluates all comments and informs the contractor of final changes.

4. The contractor revises the report.

5. The contractor sends the second draft report to the project leader.

6. (a) The project leader reviews the final report to ensure that all comments have been satisfactorily addressed. He/she distributes the report to the team members, notifying them of the deadline for final comments.

   (b) The team members check the report to ensure that it adheres to all major technical and policy procedures. They notify the project leader in writing of any additional changes. The project leader and team members send copies of all correspondence involved in report processing to the CTC Co-chair. The Co-chair resolves any outstanding issues with team members and their management chains before publishing the report.



*Completion of CTC project assignment
**Applies to Technical Guidance Reports only

Figure 4-7 Sequence of Events in Completing CTC Projects for OAQPS

7. After the deadline for comments on all formal reports, the project leader ensures that all issues have been addressed. He/she then prepares the printing request and submits it to the office director for signature following normal ESD procedures.

8. After evaluating any additional comments, the project leader submits the report to the contractor for revision.

9. The contractor finalizes the report. The project leader, then, confers with the OAQPS Co-chair to determine the number of copies to be printed.

10. The Co-chairs distribute copies of the report to the SC members for final technical and policy approval.

11. (a) The OAQPS Co-chair sends copies of each technical guidance project report to the AEERL Co-chair for concurrence and distribution to the laboratory director.

    (b) The AEERL director concurs on the report.

12. The OAQPS Co-chair submits the report to the division director for signature.

13. The CTC issues the report.

5.0 GUIDELINES FOR RESPONDING TO REQUESTS FOR TECHNICAL ASSISTANCE

This section describes the different types of requests for CTC assistance and procedures for responding to them. The CTC receives three types of requests for technical assistance as described below:

1. HOTLINE Calls. The CTC receives most of its requests for technical assistance through the CTC HOTLINE. The Center uses the "CTC HOTLINE ASSISTANCE RECORD " (HOTLINE form) to refer these requests to AEERL and OAQPS' Emission Standards Division (ESD) staff.

2. Direct-to-Staff Telephone Calls. As CTC clients become familiar with AEERL and ESD staff and their expertise, they may contact staff members directly. Direct-to-staff requests deserve the same degree of attention as do HOTLINE requests and should be documented with the CTC. The best way to document a request for assistance is to complete a HOTLINE form.

3. Written Requests. CTC clients typically submit written requests for technical projects. The CTC Steering Committee (SC) considers each written request separately.

The Clean Air Act Amendments of 1990 require the EPA to provide services to clients other than State and local agencies and EPA Regional Offices. The Amendments have resulted in the expansion of the CTC program to include the small business assistance program. However, the CTC has not yet established protocol on the extent of its support to private industry and small business. The CTC accepts calls from all businesses, as it does from traditional HOTLINE requestors, and provides them with limited services. The Center tracks private industry calls with a special data base. However, the Center will initiate no activity requiring the expenditure of CTC resources until a decision is made on the extent and scope of the support that it will provide these clients.

5.1 THE CTC HOTLINE

AEERL and ESD staff answering requests for assistance should always

BE PROMPT ... BE RESPONSIVE ... BE RESPONSIBLE

The CTC established the following guidelines for responding to HOTLINE calls in a consistent manner. These procedures outline the minimum standards of conduct for responding to HOTLINE requests.

Be prompt.

An AEERL or ESD staff member receiving a HOTLINE form or other request for technical assistance contacts the requestor as soon as possible (always within 24 hours). A State or local air pollution control permit engineer may have an important question and a deadline. The worst outcome for the requestor is to be unsure if anyone will return the call in time.

A responder who does not have time to return a call, informs his/her supervisor. The supervisor may either (1) have someone else respond to the call, or (2) contact the CTC Co-chair to consider another solution. If the CTC cannot respond within a reasonable time or before an established deadline, the Co-chair may contact the requestor with an alternate deadline. This contact will allow the caller to seek other resources or delay action until he/she receives a response. At least, an initial contact assures the caller that the CTC is attempting to respond to the request.

Be responsive.

A response may provide the caller with an immediate answer or require research. The responder should:

1. Determine how quick a response and the degree of detail the requestor needs

2. Give the requestor an estimate of how soon and what type of assistance he/she may expect

3. Comply with his/her commitment. If a responder foresees that he/she cannot keep his/her commitment, he/she should inform the caller as soon as possible

The AEERL or ESD staff member responding to a request for assistance should take the time to ensure that he/she has fully satisfied the request. He/she should determine if the requestor needs any further assistance.

Be responsible.

The AEERL or ESD staff member is responsible for providing the best assistance that he/she can. If he/she lacks the experience or knowledge to fully satisfy a request, he/she should pursue other resources. He/she may consider one or more of the following steps to complete his/her response.

1. Asking his/her supervisor for advice

2. Referring the caller to other ORD or OAQPS staff members

3. Referring the caller to another support group (the CTC Co-chairs have a list of other support groups)

4. Ordering a literature search from the EPA library (the responder may call the librarian at extension 2777)

5 Consulting the CTC Co-chair for help in determining what constitutes a reasonable and appropriate response (the Co-chair may also provide referrals to other groups or individuals for assistance)

An AEERL or ESD staff member should contact his/her supervisor or the CTC Co-chair if he/she is unsure as to how much effort is appropriate in responding to a HOTLINE request. *All requests for CTC assistance should be documented.* A HOTLINE form should be completed immediately when assistance is provided. Section 5.3 provides detailed instructions on completing the CTC HOTLINE form.

5.2 GUIDELINES FOR HOTLINE COVERAGE

The following guidelines apply to the CTC program staff in providing HOTLINE coverage.

1. The CTC Co-chairs or their assigned staff (HOTLINE designees) answer the HOTLINE during normal duty hours (7:30 am - 5:00 pm).

2. HOTLINE coverage rotates weekly between ESD and OAQPS. Each organization's CTC Co-chair answers the HOTLINE during his/her rotational period or assigns a staff member to answer the HOTLINE.

3. Section 10 of this Manual provides a list of CTC experts and associated technology assistance programs for referral of HOTLINE calls.

4. The HOTLINE designee completes a HOTLINE form for each call. Clients include representatives of State, local, and federal agencies, and private industry. The HOTLINE designee marks the form for each private industry call "private" for tracking by a special data base.

5.3 GUIDELINES FOR COMPLETING CTC HOTLINE FORMS

The CTC HOTLINE form is crucial to the program's administration. The form is typically a record of the CTC's first contact with a client. It provides computer tracking data so the CTC may ensure that each request receives a satisfactory response. The HOTLINE form records requestor contact and mailing information for any necessary follow-up and mailing list maintenance. The CTC also uses data from the form for geographical and other analysis of the sources of HOTLINE calls. In addition, the HOTLINE form abstracts the request and provides data for tracking the subjects of calls. Those data enable the Steering Committee to identify areas of widespread concern when choosing projects to sponsor. The forms also provide data for management staff to identify personnel responding to CTC calls and how much time they are consuming with HOTLINE requests. Therefore, accurate completion of the HOTLINE form is essential. Figure 5-1 is a sample HOTLINE form. The following steps provide guidelines for the HOTLINE designee and assignee for completing and distributing the HOTLINE form.

1. The HOTLINE designee completes a HOTLINE form for each call requesting CTC assistance, except for document requests. He/she uses a "CTC Report Ordering Form" for each CTC document request. Section 6 provides guidelines for completing Report Ordering Forms and distributing documents.

2. CTC clients include the staffs of State, local, and federal agencies, and private industry to the extent outlined in Section 1.

3. The HOTLINE designee completes the top portion of HOTLINE form ("Date" through Assignee/Completed By"). The abstract should clearly indicate the purpose of the call and summarize the request.

   Tables 5-1 and 5-2 are process and pollutant codes for HOTLINE request data entry. HOTLINE designees may refer to the tables for standard language in completing the HOTLINE form.

4. The designee selects the expert (assignee) who appears best qualified to respond to the request. Section 10 provides a list of ESD, AEERL, and identified State and Regional experts.

   a. When possible, the designee contacts the assignee before directing a request to him/her.

   b. When an expert is unavailable or the request is outside the scope of the CTC, the HOTLINE designee may refer the requestor to one of the associate hotlines and clearinghouses identified in Table 10-3. "Accessing EPA Clearinghouses and Hotlines," EPA/IMSD-90-009, August 1990, may also be consulted. The designee completes the HOTLINE form indicating to whom the call was redirected, the date, and the time consumed. The HOTLINE designee indicates himself/herself as the assignee.

   c. The HOTLINE designee directs calls from non-CTC clients to the appropriate organization.

5. When a HOTLINE designee directs a call to an associate organization, he/she identifies that organization in the form's response section. The designee enters his/her own name as the assignee and completes the "Date of Response" and "Time Consumed" portions of the HOTLINE form.

CTC

HOTLINE ASSISTANCE RECORD

DATE: / /	Pollutant(s)
Received by:	Industry/Process/Subject Area

Requestor's Name:
Agency Affiliation:
Address:

City/State/Zip

Telephone No. ( )

Abstract of Request:

☐ continued on a separate page(s)?

Assignee/Completed by:

RETURN CALL WITHIN 1 DAY OF REQUEST

Abstract of Response:

☐ continued on a separate page(s)?

Date of Response: / / Time Consumed: __ __.__ Hrs.

RETAINED BY "CTC"

Copy 1

Figure 5-1 Sample HOTLINE Form

Table 5-1 HOTLINE Process Codes

ABRASIVE BLASTING
ACCIDENTAL RELEASE
ADHESIVES
AEROSPACE
AGRICULTURE
AIRPORTS
AIR STRIPPING
ASBESTOS
ASPHALT
AUTOMOBILE MANUFACTURING
AUTOMOBILE REFINISHING
BOILERS
BRICK, CERAMIC, CEMENT
CARBON ADSORPTION
CHEMICAL HANDLING
CHEMICAL MANUFACTURING
COAL HANDLING
CO-GENERATION
COKE OVENS
CONCRETE CRUSHING
CONSTRUCTION/DEMOLITION
CONTAMINATED SOIL TREATMENT
COOLING TOWERS
CREMATORIUMS
DEGREASERS
DRY-CLEANING
DUST CONTROL
ELECTRONICS
ELECTROPLATING
ELECTROSTATIC PRECIPITATORS
ENGINES, DIESEL
ENGINES, GAS
ENGINES, INTERNAL COMBUSTION
EQUIPMENT LEAKS
EXPLOSIVES
FERTILIZER
FIBERGLASS
FIRE PROTECTION
FLARES
FOAM BLOWING
FOOD AND BEVERAGES
FOUNDRIES
FURNITURE MANUFACTURING
GASOLINE HANDLING
GLASS MANUFACTURING
GRAIN PROCESSING
HAZARDOUS WASTE
HOSPITAL STERILIZERS

(Continued)

Table 5-1 HOTLINE Process Codes (Continued)

INCINERATION, HAZARDOUS WASTE
INCINERATION, MEDICAL WASTE
INCINERATION, MISCELLANEOUS
INCINERATION, MUNICIPAL WASTE
INCINERATION, WOOD
INDOOR AIR
IRON AND STEEL
KILNS
LANDFILLS
LEAD-ACID STORAGE BATTERIES
METAL FABRICATION
MINING/QUARRYING
N/A
OTHER
PAINTING AND COATING
PAINT STRIPPING
PAPER/PULP MILLS
PESTICIDES
PETROLEUM PROCESSING
PHARMACEUTICALS
PHOTOGRAPHIC PRODUCTS
PLASTICS
POWER PLANTS
PRINTING, GRAPHICS
RECYCLING, METALS
RECYCLING, MISCELLANEOUS
RECYCLING, OIL
REFRIGERATION/AIR CONDITIONING
RUBBER CURING AND RECLAIMING
SCRUBBERS
SEWAGE TREATMENT
SMELTERS
SOLDERING
SOLID WASTE DISPOSAL
SOLVENTS
STACK TESTING
STORAGE TANKS, ABOVE GROUND
STORAGE TANKS, UNDERGROUND
TEXTILES
TIRE BURNING
TOXIC METALS DISPOSAL
TRANSPORTATION
TURBINES
WAFERBOARD
WASTEWATER TREATMENT
WELDING
WOOD PRODUCTS
WOODSTOVES

Table 5-2 HOTLINE Pollutant Codes

ACETONE
ACRYLONITRILE
AIR TOXICS
AMMONIA
ARSENIC
ARSINE
ASBESTOS
BARIUM
BENZENE
BERYLLIUM
CADMIUM
CARBON DIOXIDE
CARBON DISULFIDE
CARBON MONOXIDE
CARCINOGENS
CFCs/FREON/FLUOROCARBONS
CHLORINE
CHLOROFORM
CHROMIUM
COPPER
DIOXINS
DUST
ETHYLENE OXIDE
FLUORIDES
FLY ASH
FORMALDEHYDE
FURANS
H2S
H2SO4
HALON
HCl
HERBICIDES/PESTICIDES
HYDROGEN PEROXIDE
ISOCYANATES
ISOPROPYL ALCOHOL
LEAD
MAGNESIUM
MEK
MERCURY
METALS
METHANE
METHYLENE CHLORIDE
N/A
NITRIC ACID
NITROARENES
NITROGEN OXIDES
ODOR

(Continued)

Table 5-2 HOTLINE Pollutant Codes (Continued)

OTHER
OZONE
PAH
PARTICULATES
PATHOGENS
PCBs
PENTANE
PERC
PHOSPHINE
POLYCYCLIC ORGANIC MATTER
RADIOACTIVE
RADON
STYRENE
SULFUR
SULFUR OXIDES
TCE
TOLUENE
VARIOUS
VISIBLE EMISSIONS
VOCs

6. Upon completion of the HOTLINE form, the HOTLINE designee:

   a. Forwards the top (white) copy to the respective OAQPS or AEERL Co-chair for CTC records and tracking

   b. Forwards the "goldenrod" copy to the assignee's supervisor, if requested

   c. Forwards or hand-carries the yellow and pink copies to the assignee for immediate response

7. If the assignee is not in the immediate area, the HOTLINE designee contacts him/her with the client's name and telephone number and a summary of the request. The assignee uses that information to respond to the request immediately. The designee then forwards the HOTLINE form to the assignee for completion.

8. The HOTLINE designee refers calls concerning the Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate (RACT/BACT/LAER) Clearinghouse or RACT/BACT/LAER Information System (BLIS) to Joe Steigerwald, (919) 541-2736. The HOTLINE designee sends the CTC HOTLINE form to Joe Steigerwald or his designee for resolution.

6.0 CONTROL TECHNOLOGY CENTER DOCUMENTS

In addition to immediate technical assistance the Control Technology Center (CTC) provides CTC-generated reports to its clients. Document distribution is another type of technology transfer and one of the Center's chief functions. CTC reports give clients definitive summaries and permanent references in many areas of control technology. Therefore, the CTC ensures quick and efficient responses to document requests just as it does for HOTLINE calls. The following section outlines procedures for recording document requests and preparing reports for mailing.

6.1 CTC DOCUMENT REQUESTS

Figure 6-1 is a sample of the CTC Report Request Form. The form includes CTC reports completed within the past year as well as frequently requested older reports. Figure 6-2 is a complete List of CTC Publications. Key words in report titles on both forms appear in bold letters to help identify reports when requestors do not know their complete titles. CTC staff members follow the guidelines below when responding to the request for CTC documents and completing the request form.

1. Complete the form entirely including the date and the requestor's name, mailing address, affiliation, and telephone number.

2. Check the space beside the requested document. Write the reference number for documents not included on the form (as shown on the Complete List of CTC Publications, Figure 6-2) at the bottom of the form in the space marked "other."

3. CTC Co-chairs may authorize compliance with requests for more than three different documents or for more than one copy of the same document.

4. Refer requests for documents from private industry to the National Technical Information Service (NTIS). The telephone number for NTIS is (703) 487-4650. In extreme circumstances such requests are brought to the attention of the CTC Co-chairs for resolution.

CTC REPORT REQUEST FORM

NAME_____ DATE_____
AFFILIATION_____ PHONE____/_____
ADDRESS_____
CITY, STATE, ZIP
CODE_____

REF NO.		AIR TOXICS
5	( )	**"HAP-PRO"** (software for use with HAP Manual)
9	( )	"Handbook: Control Technologies for Hazardous Air Pollutants" **(HAP Manual)**, EPA-625/6-86-014
13	( )	"Emission Factors for **Iron and Steel Sources**—Criteria and Toxic Pollutants," EPA-600/2-90-024, PB90-242314
36	( )	"Emission Factors for **Iron Foundries**—Criteria and Toxic Pollutants," EPA-600/2-90-044, PB90-266743
47	( )	"**Benzene** Enabling Document," EPA-450/3-90-009, PB91-167737
52	( )	"Determination of **Perchloroethylene** Content of Waste Materials from Filters and Still Bottoms—Conditional Test Method," EPA-450/3-91-009, PB91-161737
53	( )	"Evaluation of VOC Emissions from Heated Roofing **Asphalt**"
		COMBUSTION
14	( )	"Characterization of Emissions from the Simulated Burning of **Scrap Tires**," EPA-600/2-89-054, PB90-116955
43	( )	"Source Book **NOx Control** Technology Data," EPA-600/2-91-029, PB91-217364, PB91-217364
50	( )	"Radioactive and **Mixed Waste Incineration** Background Information Document, Volume I: Technology," EPA-520/1-91-010-1; "Radioactive and Mixed Waste Incineration Background Information Document, Volume II: Risk of Radiation Exposure," EPA-520/1-91-010-2
		SURFACE COATING/GRAPHIC ARTS
25	( )	"Evaluation of Emission Controls at Leeds Architectural Products" **(Spray Booth** Controls), EPA-450/3-89-001, PB90-120106
30	( )	**"Powder Coating** Technology Update," EPA-450/3-89-033, PB90-127341
38	( )	**"Radiation** Curable Coatings," EPA-600/2-91-035, PB91-219550
40	( )	"Best Demonstrated Control Technology for **Graphic Arts**," EPA-450/3-91-008, PB91-168427
		WASTEWATER/GROUNDWATER TREATMENT
12	( )	**"Surface Impoundment** Modeling Systems (SIMS) Version 2.0 Users' Manual," EPA-450/4-90-019a, and "Background Document for Surface Impoundment Modeling System (SIMS) Version 2.0," EPA-450/4-90-019b, PB 91-506998
26	( )	**"ASPEN** Expert System for Steam Stripping Calculations: Users' Manual," EPA-450/3-90-003
31	( )	**"Industrial Wastewater** VOC Emissions—Background for BACT/LAER," EPA-450/3-90-004, PB90-194754
32	( )	"Comparisons of **Air Stripper Simulations** and Field Performance Data," EPA/450/1-90-002, PB90-207317
33	( )	"Air Stripper **Design Manual**, Air/Superfund National Technical Guidance," EPA-450/1-90-003, PB91-125997
		WOOD PRODUCTS
27	( )	"Evaluation of Emission **Control Devices at Waferboard Plants**," EPA-450/3-90-002, PB90-131442
51	( )	"Evaluation of Air Toxic Emissions at **Minnesota's Reconstituted Panelboard** Plants," EPA-450/3-91-009
		MISCELLANEOUS
11	( )	"Assessment of VOC Emissions from **Fiberglass** Boat Manufacturing," EPA-600/2-90-019, PB90-216532
29	( )	"Affordability Analysis of **Lead Emission** Controls for a Smelter-Refinery," EPA/450-3-90-001, PB90-120122
35	( )	**"Soil Vapor Extraction**—VOC Control Technology Assessment," EPA-450/4-89-017, PB90-216995
37	( )	"Test Report: Method Development & Evaluation of Draft Protocol for **Measurement of Condensibles**," EPA-450/4-90-012, PB90-240805
39	( )	**"Polystyrene Foam** Manufacturing," EPA-450/3-90-020, PB91-102111
41	( )	**"Landfill** Air Emissions Estimate Model," EPA-600/8-90-085a, PB91-167718, manual; EPA-600/8-90-085b, PB91-507541, software
42	( )	"Assessment of the **Controllability of Condensible** Emissions," EPA-600/8-90-075, PB91-125807
45	( )	"Enabling Document for NSPS for **Oxidation Process and Distillation** Operations in SOCMI," EPA-450/3-90-018
46	( )	**"Polymer** Manufacturing Industry Enabling Document," EPA-450/3-90-019, PB91-161745
55	( )	**CTC Manual**
___	( )	Other
___	( )	Mailing List

Figure 6-1 CTC Report Request Form

REF NO.	AIR TOXICS
3	"Evaluation of Potential Emissions of TDI from Two Facilities," EPA-450/3-87-022, PB88-120845
5	"**HAP-PRO**" (software for use with HAP Manual)
9	"Handbook: Control Technologies for Hazardous Air Pollutants" **(HAP Manual)**, EPA-625/6-86-014
13	"Emission Factors for **Iron and Steel Sources**—Criteria and Toxic Pollutants," EPA-600/2-90-024, PB90-242314
24	"Source Characterization and Control Technology Assessment of **MeCl** Emissions," EPA-600/2-89-043, PB89-224471
36	"Emission Factors for **Iron Foundries**—Criteria and Toxic Pollutants," EPA-600/2-90-044, PB90-266743
47	"**Benzene** Enabling Document," EPA-450/3-90-009, PB91-167737
52	"Determination of **Perchloroethylene** Content of Waste Materials from Filters and Still Bottoms—Conditional Test Method," EPA-450/3-91-009, PB91-161737
53	"Evaluation of VOC Emissions from Heated Roofing **Asphalt**"
	COMBUSTION
4	"Guidelines for **Stack Testing** at Municipal Waste Combustion Facilities," EPA-600/8-88-085, PB88-234893
14	"Characterization of Emissions from the Simulated Burning of **Scrap Tires**," EPA-600/2-89-054, PB90-116955
19	"**Operation and Maintenance of Hospital Waste** Incinerators," EPA-450/3-89-002, PB89-190615
20	"Hospital Incinerator Operator Training Course: Volume I: **Student Handbook**," EPA-450/3-89-003, PB89-189872 and "Hospital Incinerator Operator Training Course: Volume II: **Presentation Slides**," EPA-450/3-89-004, PB89-189880
56	"Hospital Incinerator Operator Training Course: Volume III: **Instructors Manual**," EPA-450/3-89-010
43	"Source Book **NOx Control** Technology Data," EPA-600/2-91-029, PB91-217364
50	"Radioactive and **Mixed Waste Incineration** Background Information Document, Volume I: Technology," EPA-520/1-91-010-1; "Radioactive and Mixed Waste Incineration Background Information Document, Volume II: Risk of Radiation Exposure," EPA-520/1-91-010-2
	SURFACE COATING/GRAPHIC ARTS
15	"**Ultrasonic Cleaning** of Rotogravure Cylinders," EPA-450/3-89-024, PB89-216360
16	"Reduction of Volatile Organic Emissions from **Automobile Refinishing**," EPA-450/3-88-009, PB89-148282
18	"Reduction of Volatile Organic Compound Emissions from **Traffic Markings**," EPA-450/3-88-007, PB89-148274
25	"Evaluation of Emission Controls at Leeds Architectural Products" **(Spray Booth** Controls), EPA-450/3-89-001, PB90-120106
30	"**Powder Coating** Technology Update," EPA-450/3-89-033, PB90-127341
38	"**Radiation** Curable Coatings," EPA-600/2-91-035, PB91-219550
40	"Best Demonstrated Control Technology for **Graphic Arts**," EPA-450/3-91-008, PB91-168427
	WASTEWATER/GROUNDWATER TREATMENT
1	"Air Stripping of **Contaminated Water** Sources—Air Emissions and Controls," EPA-450/3-87-017, PB88-106166
12	"**Surface Impoundment** Modeling Systems (SIMS) Version 2.0 Users' Manual," EPA-450/4-90-019a, and "Background Document for Surface Impoundment Modeling System (SIMS) Version 2.0," EPA-450/4-90-019b, PB 91-506998
23	"Comparisons of **Air Stripper Simulations** and Field Performance Data," EPA/450/1-90-002, PB90-207317
26	"**ASPEN** Expert System for Steam Stripping Calculations: Users' Manual," EPA-450/3-90-003
28	"Control Technology Assessment for Air Emissions from **Wastewater Treatment**," EPA-450/3-89-008, PB89-207922
31	"**Industrial Wastewater** VOC Emissions—Background for BACT/LAER," EPA-450/3-90-004, PB90-194754
33	"Air Stripper **Design Manual**, Air/Superfund National Technical Guidance," EPA-450/1-90-003, PB91-125997
	WOOD PRODUCTS
2	"Evaluation of Emission **Sources at a Waferboard Manufacturing Plant**," EPA-450/3-87-021, PB88-107735
8	"Evaluation of Emission Factors for **Formaldehyde** from Certain Wood Processing Operations," EPA-600/8-90-052, PB88-118492
22	"Evaluation of Emission Sources from **Creosote** Wood Treatment Operations," EPA-450/3-89-028, PB89-224799
27	"Evaluation of Emission **Control Devices at Waferboard Plants**," EPA-450/3-90-002, PB90-131442
51	"Evaluation of Air Toxic Emissions at **Minnesota's Reconstituted Panelboard** Plants," EPA-450/3-91-009

(Continued)

Figure 6.1-2 Complete List of CTC Publications

REF NO.	MISCELLANEOUS
11	"Assessment of VOC Emissions from **Fiberglass** Boat Manufacturing," EPA-600/2-90-019, PB90-216532
29	"Affordability Analysis of **Lead Emission** Controls for a Smelter-Refinery," EPA/450-3-90-001, PB90-120122
35	"**Soil Vapor Extraction**—*VOC Control Technology Assessment*," EPA-450/4-89-017, PB90-216995
37	"Test Report: Method Development & Evaluation of Draft Protocol for **Measurement of Condensibles**," EPA-450/4-90-012, PB90-240805
39	"**Polystyrene Foam** Manufacturing," EPA-450/3-90-020, PB91-102111
41	"**Landfill** Air Emissions Estimate Model," EPA-600/8-90-085a, PB91-167718, manual; EPA-600/8-90-085b, PB91-507541, software
42	"Assessment of the **Controllability of Condensible** Emissions," EPA-600/8-90-075, PB91-125807
45	"Enabling Document for NSPS for **Oxidation Process and Distillation** Operations in SOCMI," EPA-450/3-90-018
46	"**Polymer** Manufacturing Industry Enabling Document," EPA-450/3-90-019, PB91-161745
49	"**BACT/LAER** Clearinghouse: A Compilation of Control Technology Determinations," "Volume I—Report Summary and Appendices, A-G," EPA-450/3-90-015a, PB90-259722 "**BACT/LAER** Clearinghouse: A Compilation of Control Technology Determinations, Volume II—Appendix H, Source Codes 1 to 3, "EPA-450/3-90-015b, PB90-259730 "**BACT/LAER** Clearinghouse: A Compilation of Control Technology Determinations, Volume III—Appendix H, Source Codes 4-6," EPA-450/3-90-015c, PB90-259748 "**BACT/LAER** Clearinghouse: A Compilation of Control Technology Determinations, Volume IV—Appendix H, Source Codes 7-12," EPA-450/3-90-015d, PB90-259755
54	"RACT/BACT/LAER Clearinghouse: A Compilation of Control Technology Determinations, First **Supplement** to 1990 Edition," EPA-450/3-91-015
55	***CTC Manual***

Figure 6.1-2 Complete List of CTC Publications (Continued)

6.2 DOCUMENT MAILING GUIDELINES

The CTC administrative staff enters requests for documents into a data base and generates mailing labels. The document mailing staff prepares the documents for mailing as follows:

1. Assemble multiple reports for one client—several to one large kraft envelope (with the address labels attached to franked labels) accompanied by:

   a. A general cover letter, as shown in Figure 6-3

   b. A CTC brochure

   c. A CTC project summary

2. Mail single documents without envelopes and the address label attached to a franked label. Seal the open edge of the report.

3. Mail CTC Newsletters with address labels applied and open edges sealed.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
AIR AND ENERGY ENGINEERING RESEARCH LABORATORY
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27711

Dear CTC Subscriber:

The Control Technology Center (CTC) is happy to provide the document(s) you requested.

The CTC was established by the EPA Office of Research and Development (ORD) and the Office of Air Quality Planning and Standards (OAQPS) to provide technical assistance to State and Local Air Pollution Control Agencies and the EPA Regional Offices. The CTC's assistance is available ONLY to State and Local Agency and Regional Office personnel and provides control technology assistance for all air pollutants and control activities. If you have a need for control technology assistance or questions about the CTC, please call the HOTLINE at (919) 541-0800 or FTS 629-0800. The attachments further describe the CTC and its projects.

If additional copies of the document are needed for State and Local Agency or Regional Office personnel, you may contact me at (919) 541-7633 or FTS 629-7633 or Mail-Drop 61 at the above address.

Sincerely,

Charles H. Darvin

Charles H. Darvin, Co-Chair
Control Technology Center

Attachments

CHD:sm

Figure 6-3 Cover Letter for CTC Documents

7.0 EPA ORGANIZATIONAL CHARTS

Figures 7-1 and 7-2 are charts of the CTC's two lead organizations, the Air and Energy Engineering Research Laboratory (AEERL) and the Office of Air Quality Planning and Standards (OAQPS). These charts provide information on the organizations' structures and division, branch, and section (where applicable) functions.

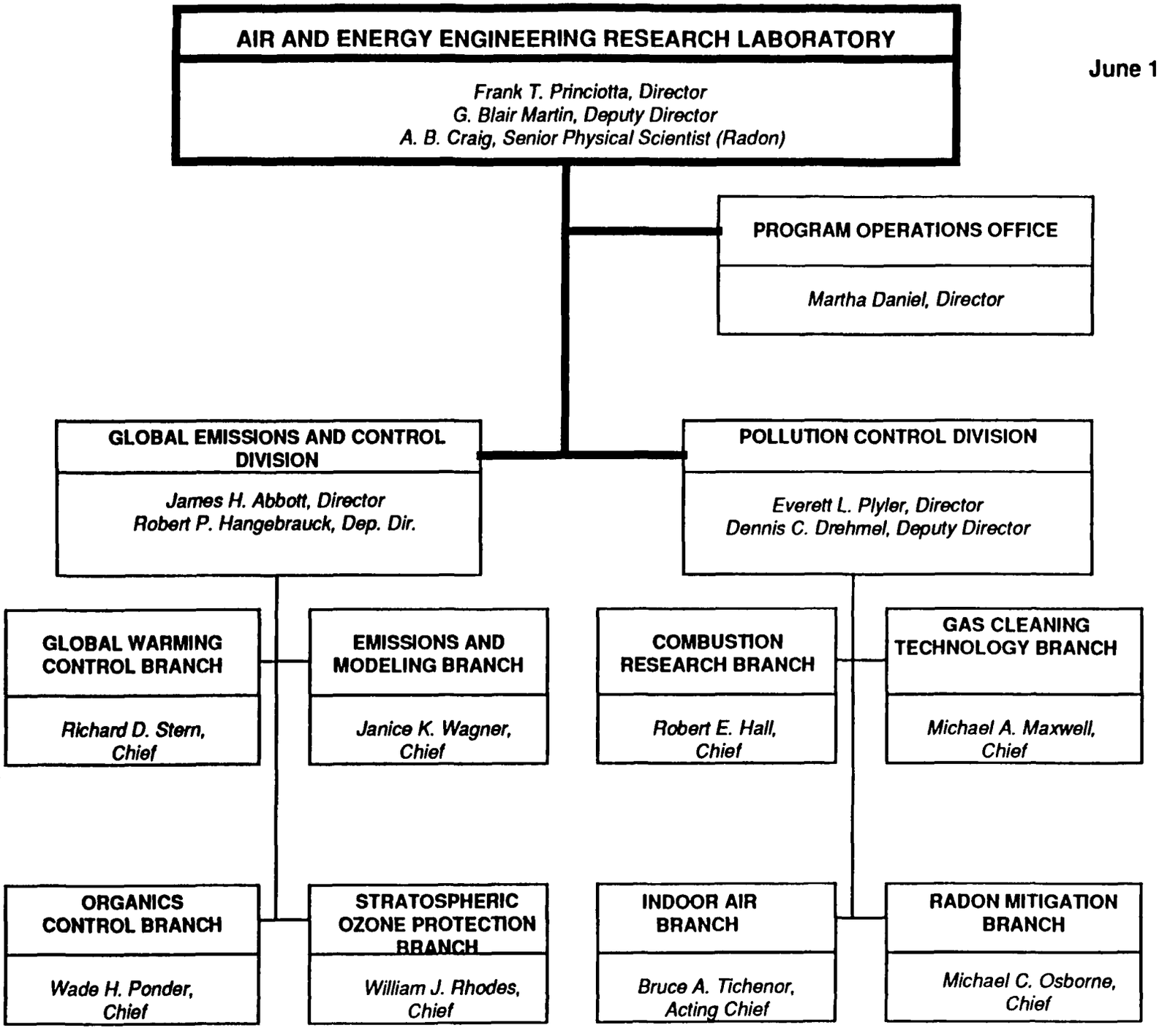


Figure 7-1 AEERL Organizational Chart

Date of organization: December 22, 1989

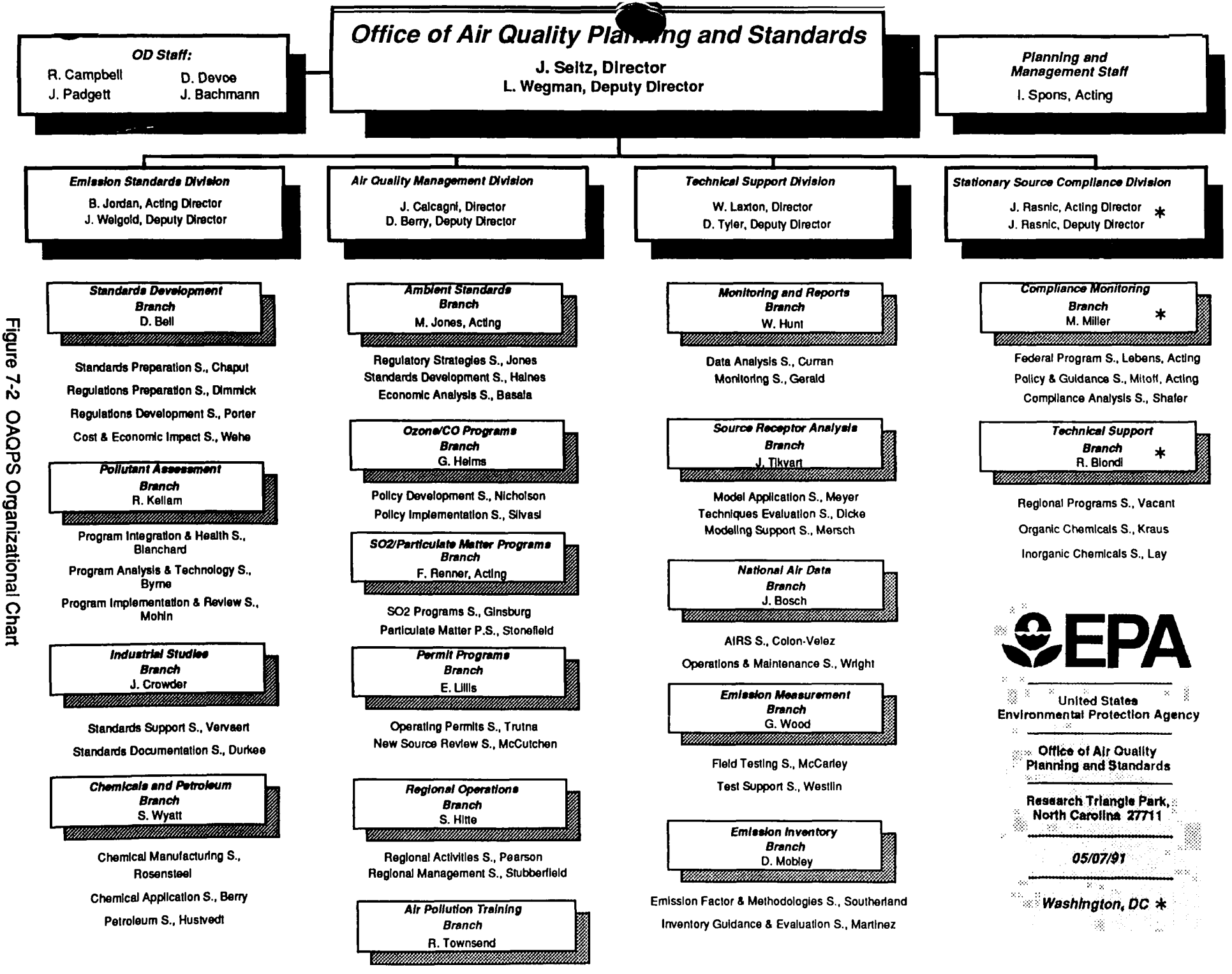


Figure 7-2 OAQPS Organizational Chart

8.0 ABBREVIATIONS

Table 8-1 provides abbreviations commonly used by Control Technology Center (CTC) staff and others conducting CTC business. CTC staff may refer to Table 8-2 for two-letter State and U.S. Territorial codes when completing CTC HOTLINE and Report Ordering forms.

Table 8-1 Program Abbreviations

AEERL	Air and Energy Engineering Research Laboratory
Air RISC	Air Risk Information Support Center
APTI	Air Pollution Training Institute
ALAPCO	Association of Local Air Pollution Control Officials
AP-42	EPA Publication AP-42, "Compilation of Air Pollution Emission Factors"
BACT	Best Available Control Technology
CERI	Center for Environmental Research Information
CTC	Control Technology Center
CTG	Control Techniques Guidelines
LAER	Lowest Achievable Emission Rate
NATICH	National Air Toxics Information Clearinghouse
NESHAP	National Emission Standards for Hazardous Air Pollutants
NSPS	New Source Performance Standards
NSR	New Source Review
OAQPS	Office of Air Quality Planning and Standards
ORD	Office of Research and Development
PSD	Prevention of Significant Air Quality Deterioration
RACT	Reasonably Available Control Technology
SARA III	Superfund Amendments and Reauthorization Act
STAPPA	State and Territorial Air Pollution Program Administrators
WA	Work Assignment

Table 8-2 State and U.S. Territorial Abbreviations

AL	ALABAMA
AK	ALASKA
AZ	ARIZONA
AR	ARKANSAS
CA	CALIFORNIA
CZ	CANAL ZONE
CO	COLORADO
CT	CONNECTICUT
DE	DELAWARE
DC	DISTRICT OF COLUMBIA
FL	FLORIDA
GA	GEORGIA
GU	GUAM
HI	HAWAII
ID	IDAHO
IL	ILLINOIS
IN	INDIANA
IA	IOWA
KS	KANSAS
KY	KENTUCKY
LA	LOUISIANA
ME	MAINE
MD	MARYLAND
MA	MASSACHUSETTS
MI	MICHIGAN
MN	MINNESOTA
MS	MISSISSIPPI
MO	MISSOURI
MT	MONTANA
NE	NEBRASKA
NV	NEVADA
NH	NEW HAMPSHIRE
NJ	NEW JERSEY
NM	NEW MEXICO
NY	NEW YORK
NC	NORTH CAROLINA
ND	NORTH DAKOTA
OH	OHIO
OK	OKLAHOMA
OR	OREGON
PA	PENNSYLVANIA
PR	PUERTO RICO
RI	RHODE ISLAND
SC	SOUTH CAROLINA
SD	SOUTH DAKOTA
TN	TENNESSEE
TX	TEXAS
UT	UTAH
VT	VERMONT

(Continued)

9.0 CONTROL TECHNOLOGY CENTER PROJECT SUMMARIES

This section provides brief descriptions of the Control Technology Center's (CTC's) "Completed Projects," "Completed CTC Projects not Documented by Formal Reports," and "Current Projects." Each category contains sections on "Engineering Assistance" and "Technical Guidance" projects. A reference number in parentheses precedes each project title. The numbers correspond to the reference numbers on the CTC Report Ordering Form (Figure 6-1) and the Complete List of CTC Publications (Figure 6-2). The descriptions include the project leader's name and telephone number, and Environmental Protection Agency (EPA) and National Technical Information Service (NTIS) numbers for completed reports.

9.1 CONTROL TECHNOLOGY CENTER PROJECT DESCRIPTIONS

9.1.1 Completed Projects

Engineering Assistance

(2) "Evaluation of Emission Sources at a Waferboard Manufacturing Plant" (EPA-450/3-87-021, PB88-107735)

The Colorado Department of Health requested CTC assistance in determining the cause of eye and lung irritation from residents near a waferboard manufacturing plant. The CTC formed a team of State, contractor, and EPA engineers with experience in emission source evaluations and waferboard manufacturing to conduct a plant inspection. The CTC submitted the team's findings and the results of dispersion modeling performed earlier by the State in a technical report to the State agency. (Leslie Evans, 919-541-5410)

(3) "Evaluation of Potential Emissions of TDI from Two Facilities" (EPA-450/3-87-022, PB88-120845)

The Allegheny County Bureau of Air Pollution Control in Pennsylvania requested CTC assistance in evaluating five industrial facilities which store and use large quantities of toluene di-isocyanate (TDI). The bureau wished to determine the potential ambient air impact from the sources, state-of-the-art technology for controlling TDI emissions, and the potential for accidental release. EPA engineers, contractor personnel, and county representatives inspected two sites. The CTC, then, provided the bureau on control alternatives with a report documenting its recommendations. (Robert Rosensteel, 919-541-5608)

(8) "Evaluation of Emission Factors for Formaldehyde from Certain Wood Processing Operations" (EPA-600/8-90-052, PB88-118492)

The CTC conducted a project to supplement an earlier CTC report, "Evaluation of Emission Factors for Formaldehyde from Certain Wood Processing Operations" (EPA-450/3-87-023, PB88-118492). The original project provided assistance to the Virginia Air Pollution Control Board in evaluating a regulation on the control of formaldehyde emission for certain wood processing and manufacturing operations. The new report addresses new and emerging sources of formaldehyde emissions. (Kelly Janes, 919-541-2852)

(22) "Evaluation of Emission Sources from Creosote Wood Treatment Operations" (EPA-450/3-89-028, PB89-224799)

The Virginia Air Pollution Control Board requested CTC assistance in evaluating controls of emissions from a creosote wood treatment operation. The CTC provided the State with a report, which discusses the various techniques used to preserve a variety of wood products and their associated emissions and control technologies. (Bruce Moore, 919-541-5460)

(24) "Source Characterization and Control Technology Assessment of Methylene Chloride Emissions from Eastman Kodak Company, Rochester, NY" (EPA-600/2-89-043, PB89-224471)

The New York Department of Environmental Control requested assistance in the evaluation of potential control technologies for emissions of methylene chloride (also known as dichloromethane or DCM) at the Eastman Kodak facility in Rochester, New York. DCM is a solvent that Kodak uses in the manufacture of cellulose triacetate support for photographic film. The CTC provided the State

with a report detailing results of a site visit and potential control options. (Chuck Darvin, 919-541-7633)

(25) "Evaluation of Emission Control Options at Leeds Architectural Products" (EPA-450/3-89-001, PB90-120106)

The CTC conducted an evaluation of possible controls of Volatile Organic Compound (VOC) emissions from a specialty aluminum coating facility for the Connecticut Department of Environmental Quality. The CTC project team visited the facility to evaluate the operation and gather data for a technical and economic evaluation of control options. (Dave Salman, 919-541-5417)

(27) "Evaluation of Emission Control Devices at Waferboard Plants," EPA-450/3-90-002, PB90-131442)

Following complaints of eye and lung irritation from residents near a waferboard manufacturing plant, the State of Colorado requested CTC assistance in evaluating the plant's emissions and possible control options. The CTC study focused on the evaluation of an electrified filter bed and a wet electrostatic precipitator (ESP). The CTC published a report documenting its findings and recommendations. (Les Evans, 919-541-5410)

(28) "Control Technology Assessment for Air Emissions from a Wastewater Treatment Operation" (EPA-450/3-89-008, PB89-207922)

The West Virginia Air Pollution Control Commission requested an evaluation of a wastewater treatment system at a chemical company which manufactures chlorinated hydrocarbons. The CTC project team visited the plant to evaluate the company's emission controls. The Center, then provided the State of West Virginia with a report on controls impact. (Bob Lucas, 919-541-5672)

(29) "Affordability Analysis of Lead Emission Controls for a Smelter-Refinery" (EPA/450-3-90-001, PB90-120122)

The CTC evaluated control technology to reduce ambient air emissions at a primary lead smelter to levels necessary to attain the ambient air quality standard. The CTC produced a report documenting its findings including an economic analysis of various control options. (Don Gillette, 919-541-5308)

(51) "Evaluation of Air Toxic Emissions at Minnesota's Reconstituted Panelboard Plants" (EPA-450/3-91-009)"

The CTC assisted the State of Minnesota in a comprehensive study of air emissions and control options for waferboard plants. The study's objectives were to characterize the plants' operations, identify air emission sources, and assess the probable species and quantities of air toxics emitted. (Tom Donaldson, 919-541-0830)

Technical Guidance

(1) "Air Stripping of Contaminated Water Sources—Air Emissions and Controls" (EPA-450/3-87-017, PB88-106166)

Numerous State and local agencies expressed interest in air stripping of contaminated water on a national basis. In response, the CTC collected information on the air emissions and controls for this source of volatile organics (VOs). The CTC investigated air emission controls used for air stripping, their performance, and the capital and operating costs of these controls. The CTC published a document listing over 150 air strippers, their locations, and particular chemicals of

concern as to their VO emissions. The document included design and operating data, as well as discussion on removal efficiency and applicable control systems. The report estimated capital and operating costs using actual facility data and standard EPA costing procedures. (James Durham, 919-541-5672)

(4) "Guidelines for Stack Testing at Municipal Waste Combustion Facilities" (EPA-600/8-88-085, PB88-234893)

In a joint effort with the Northeast States for Coordinated Air Use Management (NESCAUM), the CTC developed an interim protocol for sampling of municipal waste combustors. A work group was formed from EPA, State and local agencies, industry, and contractors to develop the protocol. The report documents their consensus on which sampling methods should be used. (Larry Johnson, 919-541-7943)

(11) "Assessment of VOC Emissions from Fiberglass Boat Manufacturing (EPA-600/2-90-019, PB90-216532)

The CTC conducted a project to define the nature and scope of VOC emissions, particularly styrene, from the manufacture of fiberglass marine structures. This report includes a characterization of the fiberglass boat manufacturing industry, an estimation of VOC emissions on a "per plant" and national basis, speciation of emissions, and identification of potential control options. (Chuck Darvin, 919-541-7633)

(12) "Surface Impoundment Modeling System (SIMS) Version 2.0 Users' Manual" (EPA-450/4-90-019a), "Background Document for Surface Impoundment Modeling System (SIMS) Version 2.0" (EPA-450/4-90-019b, PB91-506998)

A number of State and local agencies have requested improvements to the SIMS software. The original model was produced for State and local agencies to use in preparing volatile organic compound and toxic emissions inventories. (David Misenheimer, 919-541-5473)

(13) "Emission Factors for Iron and Steel Sources—Criteria and Toxic Pollutants" (EPA-600/2-90-024, PB90-242314)

At the request of Region 8 the CTC prepared a comprehensive set of criteria and toxic pollutant emission factors for integrated iron and steel plants and specialty electric arc shops. The document identifies emission factors for process sources, and process fugitive and open source fugitive emissions. The report also presents the range of values for each emission factor and the recommended best value with its rating. (Bob McCrillis, 919-541-2733)

(14) "Characterization of Emissions from the Simulated Open Burning of Scrap Tires" (EPA-600/2-89-054, PB90-116955)

In response to a number of HOTLINE requests, the CTC conducted experiments simulating open-air burning of scrap tires. Tire combustion produces various hydrocarbons, including significant amounts of polycyclic aromatic hydrocarbons, some of which are known carcinogens. The report provides estimates of emissions comparing burn rates of two sizes of tire samples. (Paul Lemieux, 919-541-0962)

(15) "Ultrasonic Cleaning of Rotogravure Cylinders" (EPA-450/3-89-024, PB89-216360)

The CTC prepared a report documenting VOC reductions, waste minimization, and other potential benefits of ultrasonic cleaning of printing equipment. Ultrasonic cleaning may reduce the

use of organic solvents, the emission of VOCs, and the generation of solvent wastes. (Bob Blaszczak, 919-541-5432)

(16) "Reduction of Volatile Organic Compound Emissions from Automobile Refinishing" (EPA-450/3-88-009, PB89-148282)

The CTC prepared a document on autobody refinishing shops and related coating processes, and coating and solvent usage. The report discusses VOC emissions and control techniques, control costs, and potential VOC emission reductions. Agencies may use the information provided in this report to develop strategies for reducing VOC emissions from automobile refinishing operations. (Robert Blaszczak, 919-541-5432)

(18) "Reduction of Volatile Organic Compounds from the Application of Traffic Markings" (EPA-450/3-88-007, PB89-148274)

The CTC published a document for use by State and local agencies in developing strategies for reducing VOC emissions from the application of traffic paints and marking materials. The publication covers application processes, VOC emissions and emission reduction, and cost benefits associated with using more durable, low-VOC markings. The document may be of particular interest to agencies in ozone non-attainment areas, which have high population densities, and therefore, a high frequency of traffic marking applications. (Karen Catlett, 919-541-0835)

(19) "Operation and Maintenance of Hospital Waste Incinerators" (EPA 450/3-89-002, PB89-190615); (20) "Hospital Incinerator Operator Training Course: Volume I, Student Handbook" (EPA 450/3-89-003, PB89-189872); "Hospital Incinerator Operator Training Course: Volume II, Presentation Slides" (EPA 450/3-89-004, PB89-189880); "Hospital Incinerator Operator Training Course: Volume III, Instructors Manual" (EPA 450/3-89-010)

The CTC, in collaboration with EPA's Region 3, the Maryland Department of the Environment, Air Management Administration, and EPA's Air Pollution Training Institute, developed training materials for hospital waste incinerator operators. The CTC also provides an operation and maintenance manual for State agency engineers. (James Eddinger, 919-541-5426)

(26) "ASPEN Expert System for Steam Stripping Calculations: Users' Manual" (EPA-450/3-90-003)

The CTC developed a user-friendly PC program for evaluating control technology and determining potential air toxic emissions. The program uses the computerized process simulation program, Advanced System for Process Engineering (ASPEN). State and local pollution control agencies may use the ASPEN steam stripper model for evaluating control technologies and determining potential air toxic emissions. The model offers three options for controlling VOC air emissions from the steam stripper: condensation using a refrigerant in a secondary condenser, fixed-bed carbon adsorption, and catalytic oxidation. (Penny Lassiter, 919-541-5396).

(30) "Powder Coatings Technology Update" (EPA-450/3-89-033, PB90-127341)

In pursuit of its goal to explore developing technology, the CTC documented the newest uses and technologies for powder coatings, which contain no VOC. Powder coating suppliers, and equipment suppliers and users of the newest uses and technologies for powder coatings were surveyed. The report summarizes the results of the questionnaires and includes a cost comparison of powder coating with other surface-coating technologies. (Karen Catlett, (919-541-0835)

(31) "Industrial Wastewater VOC Emissions—Background for BACT/LAER" (EPA-450/3-90-004, PB90-194754)

The CTC prepared a technical guidance document, as requested by several States and EPA Regions, for controlling air emissions from the collection and treatment of industrial wastewater. Visits were made to a pharmaceutical facility and two pulp and paper facilities to gather data for characterizing the industry and choosing a plant for testing. The report documents the CTC's findings. (Penny Lassiter, 919-541-5396)

(36) "Air Toxic Emission Factors for Iron Foundries—Criteria and Toxic Pollutants" (EPA-600/2-90-044, PB90-0266743)

The Chattanooga-Hamilton County Air Pollution Control Bureau in Tennessee requested CTC assistance in determining air toxic emission factors for iron foundries. The CTC compared data received from the American Foundrymen's Society (an industry trade association) with the existing AP-42. The effort resulted in a report identifying emission factors for process sources and process fugitive emissions for use in estimating emissions when site-specific information is not available. (Bob McCrillis, 919-541-2733)

(37) "Test Report: Method Development and Evaluation of Draft Protocol for Measurement of Condensibles" (EPA-450/4-90-012, PB90-240805)

The CTC responded to requests by several States and the State and Territorial Air Pollution Program Administrators for a test method for condensible particulate matter (CPM). The subject of the study was the impinger catch method of measuring CPM. This method allowed the determination of both filterable PM and CPM simultaneously, uses existing methodology and equipment. The CTC published a report which details the laboratory and field evaluations of the study. (Candace Sorrell, 919-544-1064)

(38) "Radiation-Curable Coatings" (EPA-600/2-91-035, PB91-219550)

The Bay Area Air Quality Management District in California requested engineering assistance in researching ultraviolet curable coatings to reduce emissions of ozone precursors. The study evaluated the engineering and economic concerns associated with radiation-curable systems and identified technical problems requiring future resolution. (Chuck Darvin, 919-541-7633)

(39) "Control of VOC Emissions from Polystyrene Foam Manufacturing" (EPA 450/3-90-020, PB91-102111)

The CTC received requests from several State and local agencies for technical guidance on VOC-blowing agents from polystyrene foam manufacturing. The CTC responded by producing a document summarizing VOC emission problems associated with the industry. The report also provided information on control alternatives and cost estimates for those controls. (Dave Beck, 919-544-5421)

(40) "Best Demonstrated Control Technology for Graphic Arts" (EPA-450/3-91-008, PB91-168427)

The CTC documented VOC control applications in graphic arts facilities using rotogravure or flexographic printing. The CTC gathered data during several plant visits, and is identifying sources using unique air flow management and capture techniques. (Karen Catlett, 919-541-0835)

(41) "Landfill Air Emissions Estimation Model from Municipal Landfills" (EPA-600/8-90-085a, PB91-167718, manual; EPA-600/8-90-085b; PB91-507541 software)

The CTC has received several HOTLINE requests for information on landfill emissions. In response, the CTC produced a user-friendly computer model and user's guide for estimating landfill emissions. The software suggests defaults for input when site-specific data are not available. (Susan Thorneloe, 919-541-2709)

(42) "Assessment of the Controllability of Condensible Emissions" (EPA-600/8-90-075, PB91-125807)

The CTC provided support to the STAPPA/ALAPCO Air Toxics Subcommittee in acquiring a better understanding of condensibles from an air toxics perspective. The CTC developed two data bases on condensible emissions, determined their chemical makeup, and evaluated the effectiveness of various control devices in reducing them. (Carlos Núñez, 919-541-1586)

(43) "Source Book: NO_X Control Technology Data" (EPA-600/2-91-029, PB91-217364)

The CTC has prepared a document to guide State and local agencies and EPA Regional Offices in reviewing the permits for non-utility combustion sources. The CTC visited several key vendors in Europe to gather data. (Charlie Sedman, 919-541-7700)

(50) "Radioactive and Mixed Waste Incineration Background Information Document," "Volume I, Technology" (EPA-520/1-91-010-1), "Volume II, Risk of Radiation Exposure" (EPA-520/1-91-010-2)

The State of New Mexico requested CTC support in developing rules for the combustion of mixed waste (contaminated by radioactive material). The CTC assisted the State by evaluating alternative emission controls and monitoring devices at mixed waste combustors. (Bob Blaszczak, 919-541-5432)

(52) "Determination of Perchloroethylene Content of Waste Materials from Filters and Still Bottoms—Conditional Test Method" (EPA-450/3-91-009, PB91-161737)

The CTC responded to a request from EPA Region 1 by defining a test method for determining the perchloroethylene (PERC) content of wastes from dry cleaning facilities. (Tony Wayne, 919-541-3576)

Completed CTC Projects not Documented by Formal Reports

Chemical and Biological Characterization of Products of Incomplete Combustion from the Simulated Burning of Agricultural Plastic

The Florida Department of Environmental Regulation, Bureau of Air Quality Management, requested an evaluation of emissions from the burning of pesticide contaminated plastics used in agriculture. The CTC evaluated two methods of burning the plastics using clean and contaminated plastics. The Center, then provided the State with data on the types and levels of emissions and their health effects. (William Linak, 919-541-5792)

Alaska Oil Spill Support

The Alaska Department of Environmental Conservation (ADEC) requested CTC evaluation of technical questions pertaining to the incineration of wastes resulting from the Alaska Oil Spill. The CTC formed a team to provide quick expert advice to Alaska. Project leaders visited the site, attended public hearings, and took part in public workshops. The CTC provided the State of Alaska with a report documenting their recommendations. (Al Vervaert, 919-541-5602; Blair Martin, 919-541-7504)

Evaluation of Excess Benzene Emissions

The CTC provided assistance to EPA Region 3 in estimating excess emissions at a petroleum products facility in Philadelphia. The project involved evaluation of the leak detection and repair program information at Chevron's Philadelphia refinery and calculating excess emissions resulting from extended delays in repairing leaks. (David Markwordt, 919-541-0837)

Arsine Scrubber Design

The CTC conducted an evaluation of the effectiveness of a scrubber for emissions of arsine at a semiconductor manufacturing plant for the San Diego County Air Pollution Control District. The CTC provided San Diego with a report documenting the results of the study. (Leslie Evans, 919-541-5410)

Pharmaceutical Plant Evaluation

The CTC assisted Region 8 in estimating and quantifying VOC emissions from a pharmaceutical manufacturer in Boulder, Colorado. However, the data collected were insufficient for a compliance determination. Additional assistance may be requested when the Regional Office has received more information from the source. (Dave Beck, 919-541-5421)

Workshop on Hazardous and Toxic Air Pollutant Control Technologies and Permitting Issues

The CTC and STAPPA/ALAPCO cosponsored this follow-up to the 1987 National Air Toxics Workshop. The follow-up, held in Spring 1988, provided information on the application of control technology for air toxics. Actual case studies were presented and discussed from industry and regulatory perspectives. The third day of the workshop, open only to regulatory personnel, furnished an opportunity to discuss policy and permitting concerns. (Chuck Darvin, 919-541-7633)

Colorado Weighted Carbon Monoxide Emission Correlation

The CTC assisted the State of Colorado in expanding EPA's certified stove data base to calculate Colorado weighted particulate and carbon monoxide averages. The project helped the State in deciding whether or not to adopt EPA's standard to replace its own regulatory effort. The project resulted in a spreadsheet on which the user may enter data on different stoves for comparison with EPA and Colorado standards. (Bob McCrillis, 919-541-2733).

Colorado Waferboard Press Vent Emissions

The CTC assisted the State of Colorado and EPA Region 8 in an in-depth engineering analysis of alternative methods for the control of condensible VOC emissions from waferboard press vents. Upon completion of the analysis, the CTC sent the State of Colorado a letter summarizing its findings. (Mike Kosusko, 919-541-2734)

9.1.2 Current Projects

Engineering Assistance

Vermont/Wood Waste Incineration

The State of Vermont requested CTC assistance after receiving complaints from citizens about odors coming from two plants that burn wood waste. The CTC conducted a preliminary study of wood waste combustion to determine if one of the Vermont plants is typical of the industry. The CTC will conduct a field test or simulated combustion to collect additional data. The results of the study may affect the State's regulations on incineration, which presently apply to combustion of wood waste. The project is scheduled for completion in August 1991. (Bob McCrillis, 919-541-2733)

Virginia/Fluff Combustion

The Virginia Department of Air Pollution Control requested CTC assistance in identifying emissions from the open burning of non-metallic automobile components known as "fluff." The CTC will obtain fluff samples and analyze samples from simulated burns. The project is scheduled for completion in October 1991. (Paul Lemieux, 919-541-0962)

Alaska/Fiberglass Burning

The CTC is responding to a request by the State of Alaska for assistance in identifying the organic and particulate products of the open burning of fiberglass structures. (Paul Lemieux, 919-541-0962)

Technical Guidance

HAP-PRO

The CTC is updating "Controlling Air Toxics," (CAT) an Advisory System (EPA-600/8-88-092, PB89-158745 for Tutorial Manual and PB89-158737 for computer diskettes), PC-based software for evaluation of permit applications. HAP-PRO, the updated program, is based on the "Handbook: Control Technologies for Hazardous Air Pollutants" (HAP Manual) (EPA-625/6-86-014). It calculates design and costs for eight control devices based on stream characteristics and control device parameters. The new program, available in August 1991, will include a screening option and a 20-30 percent reduction in the memory requirement of the previous version. (Carlos Núñez, 919-541-1156)

HAP Manual Update

The CTC is updating the HAP Manual. The Manual was developed to provide assistance to State and local agencies and EPA Regional Offices in selecting, evaluating, and determining the cost of controls for hazardous air pollutants (HAPs) from commercial sources. The HAP Manual contains information for authorities reviewing permit applications and for individuals requesting information on HAP control systems. The Manual will be available in August 1991 for use with HAP-PRO. (Carlos Núñez, 919-541-1156)

Foundry Casting Operations

The CTC is responding to a request by the Illinois EPA for a literature study. The State is concerned about odors and organic compound emissions from a foundry casting operation, and wishes to determine possible controls. The project is scheduled for completion in August 1991. (Bob McCrillis, 919-541-2733)

Automobile Spray Booth Clean-up

The State of Michigan requested a CTC study on emissions from the clean-up of paint booths in automobile assembly plants. A CTC project in response to the request is scheduled for completion in August 1991. (Mohamed Serageldin, 919-541-2379)

Evaluation of VOC Emissions from Heated Asphalt Roofing

The CTC conducted an evaluation of alternatives to asphalt roofing, which produces volatile organics and condensibles. The evaluation resulted in this project to determine air toxics emissions from hot asphalt roofing. The project is scheduled for completion in September 1991. (Bobby Daniel, 919-541-2336)

Tire Burning—Additional Analysis

The CTC is conducting further analyses as a follow-up to its earlier study to estimate emissions from the open burning of scrap tires. The follow-up will be an evaluation of the biological activity in the results of the original tire burning study. The study is scheduled for completion in October 1991. (Paul Lemieux, 919-541-0962)

Maryland/Yeast Manufacturing

The Maryland Department of the Environment requested a CTC study of VOC emissions from the manufacture of baker's yeast and available control technologies. The initial phase of the project evaluated the source category, its potential emissions, and identified its impact on ozone non-attainment. Phase II will consider alternative controls and their costs and impacts. The project is scheduled for completion in November 1991. (Martha Smith, 919-541-2421)

Burning Tires as Fuel

The CTC is responding to many requests for information on burning tires as fuel and tire pyrolysis. The study will include descriptions, emissions data, and control techniques. The project is scheduled for completion in November 1991. (Deborah Michelitsch, 919-541-0083)

Waste Wood Combustion, Joint Effort

The CTC is co-funding a project with the Department of Energy, the States of Virginia and New York, and Canada. The project will identify combustion system operating parameters and air pollution control technologies for the combustion of waste wood. Phase 1 of the effort is scheduled for completion in February 1992. (Bob McCrillis, 919-541-2733)

Reasonably Available Control Technology (RACT) for Utility Boilers

The CTC is helping the Northeast States for Coordinated Air Use Management develop a technical support document for use by the States in developing nitrous oxides RACT regulations. The document will be complete in November 1991. (Bill Neuffer, 919-541-5435)

Electrostatic Precipitator (ESP) Models

The CTC, in conjunction with the Electric Power Research Institute, is developing two ESP models. One is a full-feature ESP model with in-depth analysis capability for use by scientists and engineers. The other model will be "user-friendly," primarily for use by State and local agencies. (Norman Plaks, 919-541-3084).

Pennsylvania/Iron Oxide Process Analysis

The Pennsylvania Department of Environmental Resources requested CTC assistance in analyzing a substance that is deposited on cars, buildings, and other surfaces in the vicinity of a plant. The plant produces iron oxide for use in the recording tape industry. The CTC is receiving monthly samples for x-ray diffraction elemental analysis. (Frank Briden, 919-541-7808)

Carbon Disulfide Study

The CTC is conducting a study on emission controls for carbon disulfide. The project is being conducted in response to several HOTLINE calls, for which CTC expertise has not been available. (Deborah Michelitsch, 919-541-5437)

Small Business Guidance Document

The CTC is developing guidelines for the Federal Small Business Assistance Program to use in writing small business "enabling" documents. (Deborah Michelitsch, 919-541-5437)

Controlled Combustion of Scrap Tires

In response to many HOTLINE requests, the CTC is funding a study to examine emission characteristics from burning tires under different controlled conditions in a rotary kiln. (Paul Lemieux, 919-541-0962)

Ink and Paint Manufacturing Emissions

In response to HOTLINE requests for information on the control of emissions from ink and paint manufacturing, the CTC is gathering data and conducting a literature search. Both processes emit high levels of VOCs and tend to operate in population centers and ozone non-attainment areas. (Joe Steigerwald, 919-541-2736)

Non-Ferrous Metal Rolling

The CTC is funding a study of the non-ferrous metal rolling industry, which uses oil as a lubricant and coolant in rolling operations. The study will identify emission points, characterize emissions, and identify and evaluate control options and costs. (Joe Steigerwald, 919-541-2736)

9.2 SUMMARIES OF COMPLETED PROJECTS

"Affordability Analysis of Lead Emission Controls for a Smelter-Refinery" (EPA/450/3-90-001, PB90-120122)

The CTC responded to a request by the EPA's Region 7 to evaluate the affordability and economic impact of additional control measures for a smelter-refinery to meet the lead emissions standard. The analysis emphasized the impact of control costs on the smelter-refinery's profitability. The study incorporated cost data from two lead smelter studies and existing firm and industry data.

The CTC published a report that examines the economic impacts of EPA's ambient air lead standard on a primary lead smelter-refinery in Herculaneum, Missouri. The facility is the largest primary lead producer in the U.S. However, it has been impacted by the decrease in lead consumption, worldwide overcapacity, low prices and environmental regulations. The decline in lead consumption is considered to be completed and demand has stabilized. The facility currently complies with EPA's sulfur dioxide (SO_2) emissions standard, but faces other environmental, safety, and health regulations that contribute significantly to control costs. For example, EPA may establish stricter lead and SO_2 standards, and surface impoundment solids at lead smelters may be regulated as hazardous waste under the Resource, Conservation and Recovery Act.

The CTC report presents two alternative estimates of the cost of controls for Herculaneum to comply with the current lead emissions standard. The two compliance cost estimates examined varied greatly. Although, the facility could afford either option, the higher cost would impact the plant's earnings significantly. Additional research may be necessary for a more definitive estimate of compliance costs.

"Air Stripping of Contaminated Water Sources—Air Emissions and Controls" (EPA-450/3-87-017, PB88-106166)

The State of Florida requested assistance regarding the emissions generated by the air stripping of groundwater. Since the problems associated with these emissions were of national concern, the CTC Steering Committee decided to respond to the request by producing a guidance document on the sources and control of these emissions. Members of the CTC organizations familiar with air stripping of contaminated water were assigned to produce a document pooling the expertise on the subject from each organization.

Air stripping is used to remove volatile organic compounds (VOCs) from contaminated water and, if not designed and operated with air pollution controls, simply transfers the VOCs from the water into the atmosphere. Some of these VOCs contribute to ambient ozone formation and other VOCs are potential human carcinogens or toxics. The CTC project team collected information and data on the air emissions and controls for air stripping of contaminated water as a source of VOCs. This information was collected through a literature search, telephone contacts and plant site visits. A major purpose of this effort was to investigate the air emission controls presently used for air stripping, their performance, and the capital and operating costs of these controls.

The CTC developed a document which includes a list of more than 150 air strippers, their locations, and the particular chemicals of concern in some of their VOC emissions. Design and operating data for several air strippers include water flow rates, VOC concentrations, column height and diameter, air flow, the reported removal efficiency, and other design factors. A list of air stripping facilities using air emission controls is provided and the applicable control systems are discussed in the context of these facilities. The capital and operating costs are estimated using actual facility data and standard EPA costing procedures. Appended to the document is a list of telephone contacts with EPA, State and local, operating facility, and equipment vendor personnel.

During development of this technical guidance document, the CTC, along with State and local representatives and EPA contractor support, performed three site visits. For each site, general information, process descriptions, and performance data for the air stripper and the air pollution control device are provided.

Alaska Oil Spill Support

The Alaska Department of Environmental Conservation (ADEC) requested an EPA evaluation of technical questions pertaining to the incineration of wastes resulting from the Exxon oil spill at Valdez. In response, the CTC formed a team to provide quick expert advice to Alaska. Project leaders visited the site, attended public hearings, and participated in public workshops. The CTC provided recommendations to the State of Alaska.

Exxon had suggested incineration of the estimated 8,000 tons of solid waste resulting from the Valdez oil spill. However, the oil company raised concerns over the environmental acceptability of the disposal process. The CTC concluded that use of appropriate technology and operating procedures would cause no adverse environmental impact.

The CTC presented a brief review and assessment of the thermal treatment technologies that Exxon might use to dispose of certain waste resulting from the oil spill. Generally, EPA and the ADEC concurred with Exxon's basic waste management plan, but questioned the appropriateness of the proposed incineration technologies. EPA and Alaska considered four major issues in approving the thermal treatment:

- Compliance with applicable environmental regulations
- Compatibility with specific waste characteristics
- Public perception of the plan, and
- Cost

The State's consideration of public concern, which establishes acceptable performance levels, prompted them to recommend that incinerators meet certain criteria. The criteria were similar to requirements for hazardous waste incineration operation to meet environmental regulations and permit conditions. The CTC provided a brief review of regulatory requirements, a discussion of various generic classes of incineration technologies, and an assessment of their applicability to the Valdez waste.

"ASPEN Expert System for Steam Stripping Calculations: Users' Manual" (EPA-450/3-90-003)

The CTC and the EPA's Office of Air Quality Planning and Standards developed the Expert System, a personal computer (PC) software program that uses the "Advanced System for Process Engineering" (ASPEN) user model. The model describes the process of steam stripping of volatile organic compounds (VOCs) from wastewater feed streams. It allows the user to run an ASPEN steam stripping simulation without any knowledge of ASPEN programming.

ASPEN is a commercial software package for chemical process design and simulation, which allows modular building of flowsheet blocks to represent a steam stripper with or without air emission controls. It also contains an extensive physical property library and costing routines.

The "front-end" Expert System will read a general ASPEN input file, modify it according to data supplied by the user, and create a new input file tailored to the problem at hand. The program can be run on an IBM-compatible PC equipped with 640K of RAM. The software has interactive menus and on-screen help and instructions making most operations self-explanatory.

The user loads an existing data set or chooses default values using the Expert System's first screen. The user then selects the items of interest from the main menu and enters the appropriate data. When data entry is complete the program returns to the main menu. After creating a custom ASPEN input file on the Expert System, the input file is uploaded from the PC to an EPA-VAX for execution by telephone with a modem-equipped PC and appropriate communications software.

The Expert System user can run the model in either the rating or design mode. The user can evaluate an existing stripper design in the rating mode, by entering basic design parameters such as flow rates, concentrations, and tower dimensions. In the design mode, the model will calculate the necessary optimum tower design to achieve the specified effluent limits and provide sizing information for the selected control equipment. The user need enter only the wastewater flow rate, influent concentrations, desired removal rates or effluent concentrations, and the air emission control selected. In both modes the steam stripper ASPEN model determines the capital and operating costs associated with the stripper as well as the control equipment.

State and local pollution control agencies may use the ASPEN steam stripper model for evaluating control technologies and determining potential air toxics emissions. The model offers three options for controlling VOC air emissions from the steam stripper: condensation using a refrigerant in a secondary condenser, fixed-bed carbon adsorption, and catalytic oxidation.

"Assessment of the Controllability of Condensible Emissions" (EPA-600/8-90-075, PB91-125807)

The CTC provided support to the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials Air Toxics Subcommittee in acquiring a better understanding of condensible emissions from an air toxics perspective. The major objectives of the study were to: (a) develop a data base on condensible emissions, (b) determine chemical makeup of condensible emissions, (c) evaluate the effectiveness of various control devices in reducing condensible emissions , and (d) identify modifications to improve performance.

Two data bases were developed from a review of emissions source test reports from EPA's Emission Measurement Branch (Office of Air Quality Planning and Standards/Technical Support Division) files and from the State of California. The Condensibles Data Base contains information on condensible emissions covering 43 emission source categories. The Speciated Condensibles Data Base focuses on the chemical composition of condensible emissions. For the purposes of this study, the back-half catch of the EPA Reference Method 5 or its equivalent was considered to represent the condensible fraction.

Based on the data contained in the Condensibles Data Base, source categories with a relatively high percentage of condensibles in the total particulate catch (i.e., greater than 50%) included the following: plywood manufacturing, asphaltic concrete, electric utilities, fertilizer manufacturing, and secondary lead smelting. From the limited data on chemical composition of condensed particulate matter, the toxic fraction of condensed particulate matter (composed of arsenic, beryllium, cadmium, chromium, lead, mercury, and vanadium) was less than 1% in most cases.

For many sources in the Condensibles Data Base, wet scrubbers including venturi scrubbers, fabric filters, electrostatic precipitators (ESPs), and wet ESPs were the commonly employed particulate matter control devices. There was a wide variation in performance of these devices in controlling condensible emissions. This variation was attributed to differences in emission source characteristics such as temperature, composition, and concentration. Although limited performance data were available for specific control devices, venturi scrubbers and other wet scrubbers appeared to be more effective in reducing condensible emissions than other control devices.

No general conclusions were drawn regarding controllability of specific components because of limited data. Modifications in control device operation or design that would affect potential reductions in condensible emissions include: (a) operating at lower temperatures and higher humidity levels to enhance condensed particulate formation prior to the control device, (b) adding an ionizing section before wet and venturi scrubbers to improve collection efficiency of the fine particulate, and (c) using gas conditioning agents to induce condensed particle agglomeration.

"Assessment of VOC Emissions from Fiberglass Boat Manufacturing" (EPA-600/2-90-019, PB90-216532)

The CTC conducted a survey to define the nature and scope of volatile organic compound (VOC) emissions from the production of fiberglass marine craft. Earlier studies indicated that over 22,000 tons of VOC per year are emitted from fiberglass boat manufacturing in the U.S., mainly from styrene and cleanup solvents. Studies have also shown that the fiberglass industry may impact local air quality in coastal areas and locations near recreation waters, where boat manufacturing is concentrated.

The CTC study identified total industry VOC emissions and emissions from different industry segments, specific processes used by the industry, industry structure, and economic data. The CTC published a report summarizing its findings, including the evaluation of VOC control options. The report also described the geographic distribution of fiberglass boat manufacturing facilities. Although directed mostly toward boat manufacturing, the findings of the study are also applicable to other molded fiberglass operations.

The study's findings include industry characterization, process emissions, emission reductions through process or material changes, and emission reductions through add-on controls. The report includes the recommendation of additional study of the potential control options that it described. The report cited the substitution of lower VOC-containing materials as having the greatest potential for VOC emission reductions with low costs. The study also concluded that three control devices are reputed to potentially control VOC and styrene emissions from fiberglass boat manufacturing facilities. However, U.S. fiberglass boat manufacturing facilities are not applying the add-on controls cited yet, pending further evaluation of their technical and economic viability.

"Characterization of Emissions from the Simulated Open Burning of Scrap Tires"
(EPA-600/2-89-054, PB90-116955)

In response to several HOTLINE requests, the CTC funded Air and Energy Engineering Research Laboratory (AEERL) experiments simulating open-air burning of scrap tires. The research focused on providing qualitative and quantitative estimates of emissions resulting from open-air tire burning. AEERL scientists conducted the experiments in a specially designed burn hut containing a high-volume air-handling system that effectively simulated open-air combustion. The scientists burned large (1/6 tire cut in the shape of a pie wedge) and small (2-inch square) chunks to compare the effect of sample size on burn rate and emissions. The AEERL team analyzed gas and particulate samples for metals, volatile and semivolatile organics, and fixed gases (oxygen, carbon dioxide, carbon monoxide and sulfur dioxide).

The experiments showed that tire combustion produces numerous hydrocarbons, including a significant amount of polycyclic aromatic hydrocarbons, some of which are known carcinogens. The research also revealed that tire burning emits metals such as lead and zinc. The team also identified two distinct types of burning that occurs during tire combustion, which cause different emissions. These burning patterns correspond to the material in the tread layers and the belt layers of the tires.

The CTC published a report documenting its findings on tire combustion. In addition, the EPA's Health Effects Research Laboratory (HERL) will examine the health effects of the emissions. HERL will study the relative potency of emissions from tire combustion compared with those from conventional ore combustion sources.

Colorado Weighted Carbon Monoxide Emission Correlation for Woodstoves

The CTC assisted the State of Colorado in expanding EPA's certified stove data base to calculate Colorado weighted particulate and carbon monoxide (CO) averages. The project's objective was to investigate and clarify possible relationships between the emissions of particulate matter (PM) and CO for residential wood burning appliances. The more specific goal of the study was to determine if applicants certified under the EPA 1990 Phase II PM standard could also meet the Colorado Phase II CO standard. The CTC accomplished these objectives by compiling a data base of woodstoves meeting the EPA 1990 standard, listing the EPA weighted PM, and calculating Colorado weighted CO emission averages.

The CTC used 19 woodstove reports containing measured emissions passing EPA's 1990 standard. The reports also contained sufficient CO emission data to achieve the study's objectives. The woodstoves included in the reports consisted of 6 stoves equipped with catalysts and 13 for non-catalytic units.

The CTC produced a table listing the catalytic woodstoves with the corresponding weighted average PM and CO emissions. The study also produced a graph plotting the Colorado weighted CO emissions against the EPA- weighted PM emissions. No relationship appeared between emissions of CO and PM. However, all of the catalytic units which passed EPA's 1990 PM standard would also meet the Colorado CO limit. Another table depicts non-catalytic woodstoves, which produce significantly higher CO emissions than the catalytic units. Only three of the non-catalytic stoves, those with EPA PM emissions below about 3.6 g/hr, would meet the Colorado CO standard.

The study also generated a graph plotting Colorado weighted CO emissions against the EPA weighted PM emissions. A correlation was evident between emissions of CO and PM for the non-catalytic stoves. Carbon monoxide emissions generally increased with rising PM emissions up to a maximum of about 300 g/hr for CO at a PM level of about 6 g/hr. The CO emissions then appear to decline with further increases in PM emissions, possibly because of a relationship between burn rate and PM emissions. Increased PM emissions may correspond to increased burn rates for the non-catalytic appliances. The higher firebox temperatures associated with higher burn rates generally lead to more efficient incineration of CO.

The CTC woodstove study resulted in a listing of residential woodstoves certified by the EPA as of November 8, 1989. The effort also produced Lotus worksheets to serve as working tables for catalytic and non-catalytic stoves.

"Control of VOC Emissions from Polystyrene Foam Manufacturing" (EPA-450/3-90-020, PB91-102111)

The CTC conducted a survey of the polystyrene foam (PSF) manufacturing industry to characterize the industry and define the nature and scope of volatile organic compound (VOC) emissions from the source category. The study also identified potential controls for reducing VOC emissions, and developed cost estimates for VOC capture and control technologies. The study includes an estimate of total VOC emissions from the industry and the geographic distribution of industry facilities. The report presents a process overview and descriptions of three manufacturing processes for polystyrene foam products, and identifies process emission points.

Many previous studies of the polystyrene foam manufacturing industry focused on chlorofluorocarbon (CFC) emissions rather than VOC emissions. However, the Montreal Protocol of August 1988 restricted the production and consumption of many fully halogenated CFCs. Therefore, the PSF manufacturing industry increased its use of hydrocarbons and soft CFCs as blowing agents. That increased use is likely to cause increased VOC emissions nationwide from this source category. The country's ozone non-attainment problems have prompted EPA to evaluated the potential for reduced emissions from all VOC sources.

The CTC study concluded that the decline in CFC use will cause an increase in emissions from the manufacture of polystyrene foam products unless emission control equipment is installed or alternative blowing agents are incorporated. Some facilities have demonstrated add-on controls such as carbon adsorption and incineration. Some facilities have successfully employed the more environmentally acceptable hydrochlorofluorocarbon blowing agents in place of hydrocarbon and CFC blowing agents. However, the PSF industry is uncertain of the regulatory status of hydrochlorofluorocarbons, and are investigating other alternatives.

"Control Technology Assessment for Air Emissions from a Wastewater Treatment Operation"
(EPA-450/3-89-008, PB89-207922)

The West Virginia Air Pollution Control Commission requested an evaluation of a wastewater treatment system at a chemical company which manufactures C_1-chlorinated solvents such as methylene chloride, carbon tetrachloride, and chloroform. The wastewater generated at the plant is treated in organics/solids decanters, and a steam stripper is used to recover volatile organics before discharge. The operations cause significant air emissions with high concentrations of Volatile Organic Compounds (VOCs).

The CTC project team visited the plant to evaluate its controls and identify and evaluate other options available to control the plant's emissions of VOCs. Other field data gathered previously were used to estimate the total annual emissions of VOCs and the maximum rate of emissions caused by the operation. Control options evaluated were condensation of organics in a refrigeration system, carbon adsorption, and a combination of the two control techniques.

The wastewater at the chemical plant consisted of equipment wash water and rainfall from diked areas around the plant. The wastewater was kept in storage until the storage tanks were sufficiently full to operate the steam stripper, which ran about 75 percent of the time. When the steam stripper was started it operated continuously until all of the wastewater in storage was steam stripped. Secondary vent condenser outlets and conservation vents on decanter and feedwater storage tanks opened whenever liquid was pumped into the tanks. The vents were found to be the primary VOC air emission points at the facility.

Analysis of the operation's duct system revealed that connecting the feedwater tank headspace to the decanter tank headspace by a duct would allow displaced vapors to enter the decanter tank during the liquid pumping process. The duct would be large enough to handle the flow rate with a minimal pressure drop preventing the need to open the conservation vent. This inexpensive rearrangement of the duct system would reduce VOC emissions from the feedwater storage tank and therefore the total VOC load on a control system.

A forced drive could also be implemented downsteam of the control system with a fan that turned on automatically when the steam stripper started up. The system would prevent pressure buildup in the decanter and feedwater tanks during filling operations and subsequent opening of the conservation vents. Installation of traps on the decanter tank overflow plumbing was also identified as an effective measure to stop discharge of vent gases for a proper vent control system.

Evaluation of control alternatives for the wastewater treatment facility revealed that use of a secondary vent condenser with refrigerated glycol cooling followed by carbon adsorption offered the lowest cost for high organics removal efficiency. An impact analysis was provided to the State of Virginia.

"Emission Factors for Iron and Steel Sources—Criteria and Toxic Pollutants" (EPA-600/2-90-024, PB90-242314)

In response to a request by EPA's Region 8, the CTC conducted a study to acquire 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. The study identified emission factors for process sources, process fugitive, and open source fugitive emissions. The CTC identified the literature source for each emission factor, the range of values found, and the recommended best value with its rating.

The study resulted in a recommendation to use published emission factors whenever possible. When published emission factors are not available, the study recommended using the emission factors developed for the 1985 National Acid Precipitation Assessment Program emissions inventory. The literature search conducted in the study also discovered older studies conducted primarily on uncontrolled sources.

The CTC study found only limited information on toxic air pollutant emission factors. The report suggested the toxic air pollutant emission factors reported in the "Toxic Air Pollutant Emission Factors—A Compilation for Selected Air Toxic Compounds and Sources" (EPA-450/2-90-011, PB90-126003) despite the limitations of that study. The CTC report concluded that additional work on quantifying the emissions of toxic air pollutants from the iron and steel industry would be helpful.

"Emission Factors for Iron Foundries—Criteria and Toxic Pollutants" (EPA-600/2-90-044, PB90-266743)

Iron foundries are potentially significant sources of air pollution in certain areas of the country. The Chattanooga-Hamilton County Air Pollution Control Bureau in Tennessee requested CTC assistance in determining air toxic emission factors for iron foundries. The CTC responded to the request with a follow-on to a previous report on emission factors for iron and steel manufacturing facilities. This report is a compilation of current emission factor data that State and local agencies may use in estimating emissions from iron foundries.

The CTC study sought to provide a comprehensive set of emission factors for sources of criteria and toxic air pollutants in gray and ductile iron foundries. The Center produced a report identifying emission factors for process sources, process fugitive, and open source fugitive emissions. The emission factors are not specific to any one facility.

Studies over the past several years have focused chiefly on emissions of criteria pollutants. These pollutants include particulates, sulfur dioxide, carbon dioxide, nitrogen oxide, volatile organic compounds, and lead. More recent work has focused on air toxic pollutants, which include many different compounds. The CTC report on iron foundries summarizes the data available for both types of pollutants, and serves as a guide for estimating the emissions when emission measurements are not available.

The CTC accomplished its study of emission factors for iron foundries by conducting a literature search of the library of the U.S. EPA and the American Foundrymen's Society. The CTC reviewed publications for information which could be used for developing emission factors for any of the processes associated with iron foundries. The resulting report presents emission factors in terms of an average value or range of values as well as a rating of quality or reliability.

Estimate of Excess Benzene Emissions from Equipment Leaks

The CTC provided technical assistance to EPA Region 3 in estimating excess emissions from equipment leaks at a Chevron U.S.A., Inc. Philadelphia refinery. Region 3 was providing the estimate for a civil action in the U.S. District Court for the Eastern District of Pennsylvania. The U.S. had filed the action against Chevron U.S.A., Inc. claiming that the refinery had failed to implement an equipment leak detection program resulting in emissions of benzene into the environment.

Excess benzene emissions are not explicitly defined in the "National Emission Standard for Hazardous Air Pollutants," nor are they discussed in the notices of proposal or promulgation published in the "Federal Register." For the purposes of this evaluation, excess emissions were viewed as those emissions associated with components that continue to leak beyond the allowable 15-day period for repair of the equipment, and for which sufficient documentation for delay of repair has not been provided. Emission estimates were developed for those pieces of equipment for which repair was delayed, but for which documentation was unavailable or inadequate to justify delay of repair.

"Evaluations of Emission Control Devices at Waferboard Plants" (EPA-450/3-90-002, PB90-131442)

In 1987 the CTC published a report in response to a request from the State of Colorado following complaints of eye and lung irritation from residents near a waferboard manufacturing plant. More recently, the State of Colorado requested additional CTC assistance in determining the effectiveness of control devices for emissions from wood chip dryers in waferboard plants. This report describes the general process of waferboard production, an analysis of the extractable organics in wood, and a characterization of wood chip dryer effluents. The report discusses aerosol formation, an evaluation of emission control options, and a review of available information on press vent emissions.

The study concluded that insufficient data are available to adequately characterize wood chip dryer effluents, because of the variety of factors affecting the composition of the effluents. The study further concluded that electrified filter beds (EFBs) are more suited than wet electrostatic precipitators (ESPs) for controlling effluents generated from the drying of hardwoods and other low-resin-content woods. Wet ESPs are better than EFBs for the control of sticky, hydrocarbon-laden wood chip dryer effluent streams. However, wet ESPs have higher capital and operating costs than do EFBs. The study also identified three factors that affect formaldehyde emission from press vents: (1) the excess formaldehyde content of the resin, (b) the amount of resin used, and (c) the press temperature.

Characterization of emissions from wood chip dryers is difficult because of the limited data available. Wood species, dryer temperature, dryer loading rate, and previous drying history of the wood affect the composition of dryer effluents. An understanding of relationships between these factors and composition of wood chip dryer exhaust emissions would require comprehensive parametric test data that are currently unavailable.

"Evaluation of Emission Control Options at Leeds Architectural Products" (EPA-450/3-89-001, PB90-120106)

The Connecticut Department of Environmental Protection (CTDEP) requested assistance from the CTC in evaluating alternatives for controlling volatile organic compound emissions from a specialty aluminum coating facility. The facility had presented a best available control technology (BACT) evaluation to the CTDEP stating that added emission control was not economically feasible. The CTDEP questioned the conclusion and requested an independent evaluation.

The CTC identified several broad options for reducing emission that it planned to investigate. The options were:

- Conventional volatile organic compound control devices to control the existing exhaust streams
- Conventional methods to reduce exhaust flow and treatment with conventional volatile organic compound control devices, and
- Novel or developmental methods of achieving more cost-effective emission control

The CTC, an EPA contractor, and CTDEP visited the facility to observe the operations and gather data for a technical and economic evaluation of control options. They concluded that controlling emissions would permit the facility to increase production, and that the revenues from the production increase could help offset the added cost of the emission controls. The cost data provided in the report can also be used to estimate emission rates and costs of alternatives involving partial emission control.

"Evaluation of Emission Sources at a Waferboard Manufacturing Plant" (EPA-450/3-87-021, PB88-107735)

The State of Colorado Department of Health had received complaints of eye and lung irritation from residents near a waferboard manufacturing plant in Olathe, Colorado. The State requested assistance from the CTC in determining possible emission sources within the plant and assessing potential controls for those emissions. The results of a plant visit and a review of the plant operations and test reports are summarized in this report. The State of Colorado has also requested an investigation by the National Institute for Occupational Safety and Health.

Several activities were conducted during the course of the investigation. Data gathering involved collection of test reports, point source discharge (PSD) applications, and other information on waferboard manufacturing operations. States where waferboard is manufactured were contacted to establish controls used for various operations. A plant inspection was made to examine operations first-hand and to verify controls in-place. In addition, the State of Colorado offices were visited to discuss the extent of complaints, the stack tests conducted, and the results of modeling.

The facility uses methylene diphenylene isocyanate (MDI) as the polymer binder for wood wafers. According to the U.S. Department of Health and Human Services, MDI is a known irritant. These systems are now enclosed.

"Evaluation of Emission Sources from Creosote Wood Treatment Operations" (EPA-450/3-89-028, PB89-224799)

The Virginia Air Pollution Control Board requested information from the CTC about odor and potential air toxics control at creosote wood treatment facilities. The EPA's Emission Standards Division conducted an engineering evaluation of the wood preserving process for the CTC. Two wood treatment plants were visited and their methods of creosote wood treatment compared. The CTC then presented a report that discusses the history of the wood preserving industry, various wood preserving techniques and the air emissions associated with them.

Wood preservation involves pressure or thermal impregnation of chemicals into wood, enabling the wood to resist attack by fungi, insects, and marine borers. Preservation extends the service life of timber, conserving forestry resources, reducing operating costs for industries that use timber such as utilities and railroads, and ensuring stronger and safer support structures. Wood preservatives used in the U.S. primarily include pentachlorophenol; creosote; and aqueous formulations of arsenic, copper, chromium, or ammonia. These chemicals prevent the attack of living organisms on the wood. Their use, however, must be carefully controlled because these chemicals are also toxic to humans and aquatic organisms.

The CTC document discusses each preservative and the different processes used to treat various wood products concentrating on the use of creosote for the treatment of railroad crossties. The report also focuses on the emission sources associated with the release of odor and air toxics and the technologies currently used to control them.

"Evaluation of Potential Emissions of TDI from Two Facilities" (EPA-450/3-87-022, PB88-120845)

Allegheny County Health Department, a local agency in Pennsylvania, was concerned with plants in its district that stored and used toluene diisocyanate (TDI) in above-ground containers. The principal concern was the ability of these plants to deal with TDI emissions, which might threaten the local population. The CTC was asked to assist in verifying the effectiveness of the existing control systems and techniques. A team of experienced EPA and contractor personnel was assembled to evaluate the available information, perform site inspections, and provide a report to the local agency.

The CTC report provides a hazard evaluation for the local agency and the findings from the plant inspections, including recommendations. The section on hazard evaluation provided relevant information on the physical and chemical properties of TDI, a discussion on the potential for sudden and accidental releases associated with the use of TDI at these facilities, and specific process evaluation for these facilities. The section on the facility visits documents the process step operations and procedures, including observations of how the process operators performed and potential actions that could contribute to accidental releases or spills.

The document described and discussed the emission control systems (including a concurrent packed-tower scrubber) in use at these facilities. The recommendations made in the report include: improve fire protection and contingency plans, provide additional process monitoring and control, and improve spill procedures. The Allegheny County Health Department found this report helpful both for the specific facilities evaluated and in its review of similar sources.

"Guidelines for Stack Testing at Municipal Waste Facilities" (EPA-600/8-88-085, PB88-234893)

This CTC report presents the results of a project conducted by Northeast States for Coordinated Air Use Management (NESCAUM) and the CTC to develop nationally acceptable guidelines for stack testing at municipal waste combustion (MWC) facilities. A major objective of the project was to specify a set of "core" measurement procedures that could be applied consistently to MWC facility testing by the various federal, State, and local jurisdictions.

The document focuses on compliance testing, although recommendations on performance testing and research and development testing are also presented.

Compliance Testing—The objective of compliance testing is to determine if an MWC facility is operating within the limits imposed by regulations and those specified in its operating permit. On the basis of its understanding of current federal and State permit requirements, the NESCAUM work group determined the parameters that are likely to be measured during compliance tests. Numerical limits on emissions of the pollutants vary on a case-by-case basis.

The recommended measurement method for each parameter is described and referenced to an existing EPA method already in widespread use. The recommended method is supplemented by additional information on critical test features, quality assurance/quality control procedures, and data quality objectives. Other concerns that the Guidelines address include data quality criteria, facility operating conditions during testing, and testing multiple unit facilities.

Performance Testing—The objective of performance testing is to determine if a facility is operating in accordance with its design specifications. Thus, while compliance testing usually involves sampling of the final stack effluent, performance testing may also require sampling both upstream and downstream of air pollution control devices. The testing may include any of the parameters listed under compliance testing as well as comparisons of control device efficiency and specific organic or inorganic chemicals. There are no test methods specific for performance testing.

Research and Development Testing—The NESCAUM work group recommends that additional research and development stack testing be performed to develop, improve, and expand data bases. It also recommends that stack tests be performed to assess the effects of controllable combustion parameters on emissions of specific pollutions. In addition, the work group suggests more research to test hypotheses concerning the formation of polychlorinated dibenzodioxin and polychlorinated dibenzofuran and evaluate new combustor technologies and new or improved sampling and analysis methodologies. The work group's recommendations on reporting formats concern facility operating status, combustion process data, pollutant emission data, conversion factors, reporting other data, and reporting "not detected" values. The NESCAUM work group based its recommendations on testing conditions common in 1987 and 1988.

Investigation of Emissions From Burning of Agricultural Plastics

The State of Florida's Department of Environmental Regulation contacted the CTC in May of 1987, to request information on the emissions from the burning of black plastic used in agriculture. The plastic is applied to the ground between crop rows to control weed growth and to contain moisture in the soil. It is potentially contaminated with pesticide that is sprayed on the plants. The State was concerned about emissions from the burning of plastic but had no information on the emissions. Therefore, Florida requested CTC engineering assistance.

An ORD scientist was selected to head this engineering assistance effort. He witnessed a demonstration of plastic burning in the field and was supplied with samples of unused and contaminated plastics. He designed a sampling and simulation plan to determine the emissions from burning the plastic by simulating two modes of burning, pile burning and forced air curtain incineration, an alternative method considered by the State. The burn simulations were conducted in a small utility shed equipped with an air delivery system and small fans to simulate the two burning methods. Emissions were analyzed for combustion gases, volatile and semivolatile organics, particulate material, and toxic and mutagenic activity. Emission samples and samples of the used plastic were analyzed for the presence of several pesticides to which the plastic may have been exposed.

No pesticide compounds were identified in either combustion emission samples or dichloromethane washes of the used plastic. Biological samples, examined using the Ames test in which bacteria were exposed to whole vapor and vapor/particulate emissions, showed no toxic or mutagenic effects under the conditions of the test. Compared to pile burning, forced air curtain incineration was found to decrease the time necessary to burn a given quantity of plastic and caused some reduction in the particulate concentrations emitted. There was no significant difference, however, in the organic compounds identified in samples taken under these two burn conditions.

In addition to providing the State of Florida with a technical paper discussing the results, the EPA scientist also attended a meeting at the State's request to present the paper and answer questions. While the State's original request was fulfilled, it has requested additional analyses to provide further identification of the higher molecular weight compounds detected and more health effects information. Because of the success of this work, the CTC is now considering requests from other agencies on open burning of other materials such as automobile tires and herbicide-contaminated brush.

"Landfill Air Emissions Estimation Model" (EPA-600/8-90-085a, PB91-167718, manual; EPA-600/8-90-085b, PB91-507541, software)

In response to many HOTLINE calls, the CTC developed personal computer software for estimating emissions from municipal landfills. The anaerobic decomposition of municipal solid waste generates landfill gas. The gas is composed of about half carbon dioxide and half methane with trace constituents of nonmethane organics containing volatile organic compounds and air toxics. Scientists estimate the trace constituent of landfill gas to be 200,000 tons per year nationwide. That amount is about 2 percent of the total non-methane organics emitted by all stationary sources in this country. Landfill air emissions contribute to tropospheric ozone, air toxics, global warming, odor and explosion hazards.

The CTC based is user-friendly software for estimating landfill emissions on a first-order decomposition rate equation that uses site-specific characteristics. Those characteristics include the year the landfill began accepting waste, the amount of waste accepted, and the year or expected year of closing the landfill. The software also provides guidance on EPA methods for obtaining gas composition data. The program suggests defaults for input when site-specific data are not available. "Air Emissions from Municipal Solid Waste Landfills—Background Information for Proposed Standards and Guidelines," (MIS/0849) Office of Air Quality Planning and Standards, March 12, 1990, provides details on the development of the modeling approach and default values.

"Operation and Maintenance of Hospital Medical Waste Incinerators" (EPA-450/3-89-002, PB89-190615); "Hospital Incinerator Training Course: Volume I, Student Handbook" (EPA-450/3-89-003, PB89-189872); "Hospital Incinerator Training Course: Volume II Presentation Slides," (EPA-450/3-89-004, PB89-189880), "Hospital Incinerator Training Course: Volume III, Instructors Manual" (EPA-450/3-89-010)

In response to a request by the State of Maryland, the CTC developed an operation and maintenance (O&M) manual and training course for hospital waste incinerator operators. The O&M manual was designed as a technical guidance document on proper O&M procedures for hospital waste incinerators and related pollution control equipment. The manual may be used by federal, State, and local agency personnel, hospital waste management personnel, and hospital incinerator operators. The training course covers the basic principles of combustion; proper design, operation, and maintenance of hospital waste incineration systems; and the operator's role in reducing air pollution and complying with regulations.

Data gathered in the first phase of this study, on the proper O&M of hospital waste incinerators and associated air pollution control devices, are presented in the O&M Manual. The document provides an overview of proper O&M procedures and serves as a basis for the development of the training materials. It was also designed to serve as a technical guide for federal, State, and local agencies, and hospital waste management personnel and incinerator operators. The O&M manual covers operation, maintenance, control and monitoring instrumentation, as well as record keeping and safety guidelines. Volume I of the training course, the Student Handbook, is provided not only as a text during the course but as a reference for operators after the course. Volume II includes classroom materials as well as copies of the presentation slides and student worksheets. Volume III, the Instructors Manual, includes the course description, an agenda, the course goals, lesson plans, and pre-test and post-test materials.

Use of the O & M Manual and Training Course by hospitals, and federal, State and local agencies should lead to a better understanding of hospital waste incinerators and related emission controls by incinerator operators and supervisory staff. This increased awareness should result in more efficient use of the incinerators and emission control equipment, and therefore, help reduce air emissions from the incineration of hospital waste.

"Powder Coatings Technology Update" (EPA-450/3-89-033, PB90-127341)

The CTC provided a report summarizing the status of powder coating technology. Industries are using powder coating at an increasing frequency because of environmental concerns associated with solvent-based coatings, which cause volatile organic compound emissions. Recent improvements in powder coating technology have also contributed to the growing trend toward this coating method. The application of powder coatings, which are dry, finely divided particles, causes no release of volatile organic compounds. And the curing process associated with powder coating produces only minute amounts of volatile organic compounds. Air pollution control agencies are encouraging industrial finishing operations to use powder coatings as a means of reducing volatile organic compound emissions.

The CTC report on powder coating technology provides information on the performance, applicability, costs, and availability of powder coatings to assist State and local agencies in evaluating powder coating as an air pollution control technology. The CTC based its report on literature searches, contacts with several State and local air pollution control agencies, and written survey questionnaires to powder coating manufactures, users, and equipment suppliers. The report provides a brief history of powder coatings, the different classes of available powder coatings, and recently developed powder resins. The document also discusses the types of equipment required for a powder coating line and the types of products that are typically powder coated. And finally, the report presents the economic advantages of this technology and a cost comparison between powder and liquid coatings.

"Reduction of Volatile Organic Compound Emissions from Automobile Refinishing"
(EPA-450/3-88-009, PB89-148282)

This document provides technical information that State and local agencies may use to develop strategies for reducing volatile organic compound (VOC) emissions from automobile refinishing operations.

Automobile refinishing operations may be categorized into four process steps. These steps are vehicle preparation, primer application, topcoat application, and spray equipment cleanup. Emissions of VOCs are the result of organic solvent evaporation during vehicle preparation and equipment cleanup, and during and shortly after the application of primers and topcoats.

Emission reduction techniques that were selected for evaluation include the use of alternative coatings, spray equipment with improved transfer efficiency, and the installation of solvent recovery spray equipment cleaning systems. In estimating VOC emissions, VOC emission reductions, and costs of emission reductions, assumptions were made on the types of coatings used and equipment available for small, medium, and high volume facilities.

The results of the study indicate that several control options result in no additional cost to implement and, in fact, result in a cost savings. For small, medium, and high volume facilities, significant VOC reductions (30 to 50 percent) can be achieved by replacing conventional air-atomizing spray guns with high-volume, low-pressure (HVLP) spray equipment. A cost savings is expected from this control technique because of the higher transfer efficiency (about 65 percent for HVLP vs. about 35 percent for conventional air-atomizing spray equipment). Some problems with color matching topcoats have been reported. However, some users are reporting acceptable color matching results and have indicated that experience using the equipment is necessary to achieve good results.

For all facilities, significant VOC emission reductions can be achieved by using a solvent recovery system to clean up paint spray equipment. This control technique also results in a savings because solvent usage is reduced.

The remaining alternative controls involve switching from conventional coatings to lower-VOC coatings (e.g., urethanes) and, with a few exceptions, result in some additional cost. One exception is for facilities that use lacquers, where switching from lacquers to acrylic enamels is expected to result in a 45 percent emission reduction, as well as cost savings. The cost savings are a result of the lower cost of materials which offsets the capital cost (annualized over 10 yr) for installing a spray booth. Also, for all types of facilities, switching from conventional primers to waterborne primers is expected to result in a VOC emission reduction at no additional cost.

If multiple alternatives are implemented, the emission reduction achieved will not necessarily be the sum of the individual emission reductions indicated above. Since all the emission reductions are calculated from the baseline condition, once an alternative is implemented, subsequent implementation of other alternatives may have a different effect. Nonetheless, implementation of multiple controls will have a positive impact on VOC emission reduction.

"Reduction of Volatile Organic Compound Emissions from the Application of Traffic Markings"
(EPA-450/3-88-007, PB89-148274)

The EPA has researched methods of controlling the emission of volatile organic compounds (VOCs) from the application of highway traffic markings as part of its ongoing effort to assist States in attaining the National Ambient Air Quality Standard for ozone.

The study was conducted to evaluate alternative traffic marking techniques that can be used to reduce VOC emissions from this source. The information was generated through a literature search and surveys of State Departments of Transportation, traffic paint formulators, and application equipment manufacturers. This document provides State and local regulatory agencies with information on traffic marking application processes, VOC emissions and emission reductions, and costs associated with the alternative marking techniques. This information will allow planners to identify available alternative low- and zero-VOC traffic marking techniques, estimate the baseline VOC emission level for the planner's geographic area, and evaluate the VOC reduction and cost of implementing alternative traffic marking techniques.

The primary conclusions from this study are:

- The use of available low- and zero-VOC alternatives such as waterborne coatings, thermoplastics, field-reacted materials, preformed tapes, and permanent markers can result in VOC emission reductions ranging from 15 to 100 percent.

- The annualized costs for the alternative marking techniques are less than or equivalent to those for traditional solvent-borne paints.

- The performance of the alternative markings is equivalent to or better than that of traditional solvent-borne paints.

The report provides the necessary descriptive and modeling information to allow State and local agencies to determine which category or categories of alternative marking technologies would provide the most cost effective VOC reductions given the unique circumstances of the region involved.

"Source Characterization and Control Technology Assessment of Methylene Chloride Emissions from Eastman Kodak Company, Rochester, NY" (EPA-600/2-89-043, PB89-224471)

The New York State Department of Environmental Conservation initiated an assessment of emission control technologies for dichloromethane (DCM) sources at the Eastman Kodak Company at the Kodak Park Facility in Rochester, New York, to bring the facility into compliance with the State's air pollution regulations. DCM is used in the manufacture of cellulose triacetate photographic film support. The assessment was a result of the State's reduction of the acceptable ambient level for methylene chloride (MeCl) and Kodak's plans to increase cellulose triacetate film production. New York State requested assistance from the CTC in the identification and evaluation of viable control technologies for this source.

In response to the request, the CTC sent a team of engineers to identify DCM emissions sources at the facility. The team then evaluated the potential control technologies that might be applied to the identified emissions sources and provided a cost analysis of different control options for four of the uncontrolled emission sources.

The largest source of DCM emissions at Kodak Park was determined to be from the production of cellulose triacetate film. This process involves the dissolving of triacetate pellets in MeCl and other solvents to produce a viscous material which is then pressed onto a polished surface forming a thin sheet. The sheet is dried at high temperatures giving off MeCl and other solvents. This process was responsible for over 80 percent of the total DCM emissions from the facility. Other sources of DCM emissions included emissions from pumps, valves, seals, flanges and other equipment used at the plant, as well as from secondary losses from wastewater.

The CTC documented its findings and recommendations in a report that is available to State and local agencies and others wishing information on the control of MeCl emissions.

"Surface Impoundment Modeling System (SIMS) 2.0 Users' Manual" (EPA-450/4-90-019a)

The CTC updated its software for use by State and local air pollution control agencies in preparing volatile organic compound (VOC) and air toxics emission inventories. Together with the Technical Support Division of the EPA's Office of Air Quality Planning and Standards (OAQPS), the CTC developed SIMS, a menu-driven personal computer system. State and local agencies may employ SIMS to estimate emissions of organic compounds from impoundments at hazardous waste treatment, storage, and disposal facilities (TSDFs), publicly owned treatment works (POTWs), industrial wastewater treatment facilities, and other similar operations.

The OAQPS developed a set of emission models for sources including surface impoundments to estimate VOC emissions based on input parameters such as impoundment type and dimensions, influent flow rate, and inlet pollutant concentrations. The CTC incorporated these models into the SIMS software, which includes default values for use by State and local agency personnel who may not have information on all of the input parameters required by the models.

The SIMS program applies to flow-through and disposal impoundments and turbulent or quiescent flow. The program can also account for biodegradation when appropriate. The user must provide the type of impoundment, whether it is used for biological treatment, and the total flow into the impoundment. The user must also supply the total surface area of the impoundment and the type of industries discharging wastewater into the impoundment. The agency using SIMS may supply as much additional information as is available and use the program's default values as necessary.

Impoundments at facilities such as TSDFs, POTWs, and industrial wastewater treatment facilities may account for a significant amount of the total VOC or air toxic emissions in some areas of the U.S. SIMS provides State and local air pollution control agencies with a valuable tool in estimating these emissions. The CTC has expanded the compound data base in SIMS 2.0 and added models for diffused air systems and systems with an oil film layer for junction boxes, lift stations, sumps, and weirs. SIMS was also upgraded for application to multiple impoundment systems.

"Test Report: Method Development and Evaluation of Draft Protocol for Measurement of Condensible Particulate Emissions" (EPA-450/4-90-012, PB90-240805)

The CTC responded to requests by several States and the State and Territorial Air Pollution Program Administrators (STAPPA) for a test method for condensible particulate matter (CPM). Because current methods measure only in-stack PM, EPA considered a CPM method to be vital. EPA made the impinger catch method of measuring CPM the subject of this study. This method allowed the determination of both filterable PM and CPM simultaneously, uses existing methodology and equipment, and is being used by several State agencies. The CTC published a report which details the laboratory and field evaluations of the study.

The evaluation sought to determine the adequacy of the test method and produce supporting documentation. A further objective was to revise the candidate method based on the results of the laboratory experiments, to validate the method in field tests, and to revise the method, if necessary.

"Ultrasonic Cleaning of Rotogravure Cylinders" (EPA-450/3-89-024, PB89-216360)

The CTC conducted a technical guidance project to produce a document on the general applicability of aqueous ultrasonic cleaning in the rotogravure printing process and other graphic arts processes, and to identify the benefits and costs of ultrasonic cleaning. Ultrasonic cleaning of equipment used in these industries may reduce organic solvent use, volatile organic compound (VOC) emissions and solvent waste generation.

Ultrasonic cleaning employs the scrubbing action created by the passage of ultrasonic waves through a liquid cleaning medium. The method may be used by other industries to clean a wide variety of parts, assemblies, and finished goods. The benefits of this process include high speed cleaning and a high level of cleanliness. Also, aqueous-based cleaning liquids eliminate the emission of VOCs from cylinder cleaning and reduce the problems associated with the handling of hazardous wastes.

Aqueous ultrasonic cleaning may be applicable to all rotogravure printing operations which reuse cylinders such as the flexible packaging industry, vinyl printing, wallpaper printing, and other printing operations. The CTC report provides a list of potential applications for several selected cleaning solutions. The list identifies the solvent/solution and cleaning methods for equipment consisting of various types of metals. The methods include different combinations of presoaking, ultrasonic immersion, rinsing, solvent spraying, vapor rinsing, and drying. A combination of aqueous solution and solvent cleaning is used in some cases. But, the use of solvent-based solutions is less desirable because of the potential for emissions of VOC and the environmental impact of waste disposal.

The CTC report on ultrasonic cleaning describes the benefits as well as the disadvantages of the methods. Besides the reduction in environmental hazards afforded by this process, the method also reduces worker exposure to solvent, fire hazards in the cleanup area, and the inconvenience of hazardous waste handling. Also, cylinder cleanup is faster and less labor intensive, and downtime of the printing run is reduced. The process also improves cleaning effectiveness as well as product quality. The disadvantage of ultrasonic cleaning is the high initial cost of installing the system. However, this cost may be somewhat offset by reductions in operating costs caused by the elimination of the need to purchase solvent. Ultrasonic cleaning methods also eliminate the expense of handling hazardous waste in facilities using biodegradable detergents and nonhazardous inks.

Workshops on Hazardous and Toxic Air Pollutant Control Technologies and Permitting Issues

In 1987, EPA sponsored the National Workshops on "Developing and Implementing Air Toxics Control Programs." The attendees requested that the workshops be followed by a more specific workshop dealing with control technology and associated permitting considerations for air toxics. The CTC Steering Committee agreed to provide this assistance. The CTC asked the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials (STAPPA/ALAPCO) to work with the CTC project team to determine the topics which should be discussed. STAPPA/ALAPCO agreed this was an important area and worked with the CTC as a co-sponsor of the workshops. The specific objectives of the workshops were to:

- Communicate practical information on control technologies,
- Present actual experiences and case histories,
- Transfer state-of-the-art knowledge, and
- Promote uniformity in permitting of hazardous and toxic pollutants.

Two three-day workshops were held, one in Raleigh, North Carolina and one in San Francisco, California. The first two days were open sessions with over 300 attendees at each workshop representing EPA, State and local agencies, industry, and consulting firms. The general format included a technical speaker presenting information on a specific control device with case studies to illustrate application of the control device followed by a speaker from a State or local agency to address the permitting concerns, specific problems, or issues associated with that device. Topics included traditional controls: incinerators, flares, carbon adsorption, absorption, and fabric filters as well as process modifications and fugitive equipment leaks. The attendees also met in small groups for discussion of specific permitting problems.

The third day of the workshop was open only to State, local, and EPA personnel to discuss policy and additional permitting issues. Factors and approaches relevant to determination of best available control technologies were discussed. EPA presented information on technical assistance available to the State and local agencies. The workshop also provided a forum for State and local personnel to discuss common problems and share solutions.

10.0 ADDRESSES AND TELEPHONE NUMBERS

This section contains the names and pertinent information on CTC participants and contributing agencies. Several tables are provided for reference by HOTLINE designees, Steering Committee (SC) members and others requiring information on CTC contacts.

10.1. EXPERT LIST SORTED ALPHABETICALLY BY LAST NAME

Table 10-1 lists the Control Technology Center (CTC) experts identified for referral of HOTLINE requests. The list is sorted alphabetically by the expert's last name.

The CTC Expert List, pages 10.2 through 10.54, are restricted information available only to staff members of EPA's Office of Air Quality Planning and Standards and Air and Engergy Environmental Research Laboratory.

10.3. ASSOCIATE HOTLINES AND CLEARINGHOUSES

Table 10-3 lists hotlines and clearinghouses associated with the CTC. It also provides the names of people to contact at these programs and their telephone numbers.

Table 10-3. Associate Hotlines and Clearinghouses

Group	Contact	Phone*
AirRISC Information Support Center (AirRISC)	Holly Reid Dan Guth	(919) 541-0888 FTS 629-0888
Best Available Control Technology (BACT)/ Lowest Achievable Emission Rate (LAER) Clearinghouse	Joe Steigerwald	(919) 541-2736 FTS 629-2736
Control Technology Center HOTLINE	Bob Blaszczak Chuck Darvin	(919) 541-0800 FTS 629-0800
Emission Factor Clearinghouse	Dennis Shipman	(919) 541-5477 FTS 629-5477
Emission Measurement Technical Information Center (EMTIC)	Roy Huntley	(919) 541-1059 FTS 629-5375
National Air Toxics Information Clearinghouse (NATICH)	Nancy Riley	(919) 541-5348 FTS 629-5348
New Source Review Emission	David Soloman	(919) 541-5375 FTS 629-5375
Resource Conservation and Recovery Act (RCRA)/ Superfund HOTLINE		1-800-424-9346
Superfund Amendments and Reauthorization Act (SARA Title III) HOTLINE		1-800-535-0202
Support Center for Regulatory Air Quality Models (SCRAM)	Jerry Mersch	(919) 541-5343 FTS 629-5343

10.4 STEERING COMMITTEE MEMBERS

Table 10.4 is a list of Steering Committee members, and their addresses and telephone numbers.

Table 10-4 Steering Committee Members

Bob Blaszczak,* U.S. EPA (OAQPS) MD-13, Research Triangle Park, NC 27711, (919) 541-5432, (FTS) 629-5432

Karen Blanchard, U.S. EPA (OAQPS) MD-13, Research Triangle Park, NC 27711, (919) 541-5503, (FTS) 629-5503

Chuck Darvin,* U.S. EPA (AEERL) MD-61, Research Triangle Park, NC 27711, (919) 541-7633, (FTS) 629-7633

Dennis Drehmel, U.S. EPA (AEERL) MD-04, Research Triangle Park, NC 27711, (919) 541-7505, (FTS) 629-7505

Ken Durkee, U.S. EPA (OAQPS) MD-13, Research Triangle Park, NC 27711, (919) 541-5503, (FTS) 629-5425

Bill Harnett, U.S. EPA (AEERL) MD-13, Research Triangle Park, NC 27711, (919) 541-5253, (FTS) 629-5253

Paul Lemieux, U.S. EPA (AEERL), MD-65, Research Triangle Park, NC 27711, (919) 541-0962, (FTS) 629-0962

Justice Manning (CERI) U.S. EPA, MS-G75, 26 W. Martin Luther King Dr., Cincinnati, OH 45268, (513) 569-7349, (FTS) 684-7349

Doug McKinney, U.S. EPA (AEERL) MD-60, Research Triangle Park, NC 27711, (919) 541-3006

Wade Ponder, U.S. EPA (AEERL) MD-61, Research Triangle Park, NC 27711, (919) 541-2818, (FTS) 629-2818

Bill Rhodes, U.S. EPA (AEERL) MD-62b, Research Triangle Park, NC 27711, (919) 541-2853, (FTS) 629-2853

Jim Berry, U.S. EPA (OAQPS) MD-13, Research Triangle Park, NC 27711, (919) 541-5605, (FTS) 629-5605

Tim Smith, U.S. EPA (OAQPS) MD-13, Research Triangle Park, NC 27711, (919) 541-5352, (FTS) 629-5352 (alternate)

Jim Southerland, U.S. EPA (OAQPS) MD-15, Research Triangle Park, NC 27711, (919) 541-5523, (FTS) 629-5523

Al Vervaert, U.S. EPA (OAQPS) MD-13, Research Triangle Park, NC 27711, (919) 541-5602, (FTS) 629-5602 (alternate)

*AEERL and OAQPS Co-chairs

10.5 ADVISORY WORK GROUP MEMBERS

Table 10-5 shows the names, addresses, and telephone numbers of CTC Advisory Work Group members.

Table 10-5 Advisory Work Group Members

Jeff Cooper, Air Pollution Control Analyst, P.O. Box 972, Dayton, OH 45422, (513) 225-3486

John Glunn, Department of Environment Regulation, 2600 Blair Stone Road, Tallahassee, FL 32301, (904) 488-1344

Loyd Gravitt, Chattanooga-Hamilton County, Air Pollution Control Bureau, 3511 Rossville Boulevard, Chattanooga, TN 37407, (615) 867-4321

JoAnn Held, New Jersey Department of Environmental Protection, Department of Environmental Quality, CN027, Trenton, NJ 08625, (609) 633-1108

Gregg Lande, Oregon Department of Environmental Quality, 811 SW 6th Ave., Portland, OR 97204-1390, (503) 229-6411

Robert Sears, Air Quality, B-23, 26 Castilian Drive, Goleta, CA 93117, (805) 961-8800

10.6 STAPPA/ALAPCO AIR TOXICS SUB-COMMITTEE

Table 10.6 provides the names, addresses, and telephone numbers of the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials (STAPPA/ALAPCO) Air Toxics Subcommittee.

Table 10-6 STAPPA/ALAPCO Air Toxics Sub-Committee

Don Arkell, Lane Regional Air Pollution Control Authority, Suite 501, 225 North 5th, Springfield, OR 97477, (503) 726-2514

Bill Dennison, South Coast Air Quality Management District, 9150 Flair Drive, El Monte, CA 91731, (818) 572-6200

Terri Thomas, Ventura County Air Pollution Control District, 800 S. Victoria Avenue, Ventura, CA 93009, (805) 654-2844

Don Tyler (STAPPA) Wisconsin Department of Natural Resources, Bureau of Air Management, 101 S. Webster St., Madison, WI 53703, (608) 266-7718)

I.N. Vaughn, City of Huntsville, Air Pollution Control, 2033 C Airport Road, Huntsville, AL 35802, (205) 883-3645

APPENDIX A

BULLETIN BOARD SYSTEM

In August 1991, the CTC Bulletin Board System (BBS) officially came on-line. It is part of the EPA Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network (TTN) joining SCRAM, EMTIC, CHIEF and other electronic BBS. Users already registered on the TTN may access the CTC BBS using the same method they are currently using to access the other boards, but selecting the CTC option from the main menu. New users may dial in and register any time the BBS is in operation. The only cost involved is the cost of the telephone call to Durham, North Carolina. Figure A-1 depicts the CTC BBS welcome screen.

The CTC BBS will offer several options within four major areas. The four major areas are: Utilities, Help Center, Documents/Software, and CTC Projects. Figure A-2 depicts the CTC BBS main menu screen. Other options within each of the major areas will be considered and, if there is widespread support, added in the future. Please don't hesitate to comment on the CTC BBS and its functions.

UTILITIES

Three options are offered within this area: "Register for CTC Mail," "Welcome to the CTC," and "Read CTC Alerts." The "Register" option allows you to put your name on the mailing list for the CTC NEWS, a quarterly newsletter put out by the CTC. The "Welcome" option displays information on the CTC, its purpose, background, and services provided. The final option under this area is the "Read" option. Selecting this option allows you to reread the alerts that are displayed when you first sign-on. Two other options under this area are the "Return to Top Menu" and "Goodbye." These appear in every BBS in the TTN and are self-explanatory.

HELP CENTER

Three options are offered within this area: "Public Messages," "Electronic Mail," and "Leave CTC HOTLINE Request." The "Public Messages" option leaves a message that may be viewed by anyone. These messages may be directed to any group of users. The "Electronic Mail" option is just that, a message directed to a specific person and may only be read by that person. The "Leave CTC HOTLINE Request" option directs a message to the CTC and will generate a call-back from the CTC staff. The user, under this option, leaves a message describing his/her request, problem, or question along with his/her telephone number and other information. The CTC staff reviews the request and will call the requestor back with information or a referral, usually within 24 hours.

DOCUMENTS/SOFTWARE

Three options are offered within this area: "Ordering Documents," "Downloading CTC Software," and "Review Document Summary,"." The "Review" option brings up a short summary of each of the documents available from the CTC. Each summary will include an EPA report number and a National Technical Information Service (NTIS) document number when available. These numbers should be noted, because the CTC can only honor orders of documents from State, local, or regional government agencies. All others must order the documents from NTIS [telephone number (703)487-4650]. The "Ordering" option presents a list of CTC documents. You simply put an "x" in front of the document(s) you need and fill out the name and address. The "Downloading" option allows you to download to your computer a copy of some of the software offered by the CTC. Anyone may download software.

CTC PROJECTS

Three options are offered within this area: "List CTC Ongoing Projects," "Review List of Suggested Projects," and "Add to List of Suggested Projects." The "List Ongoing Projects" option displays a list of ongoing CTC projects and a short summary of each. The "Review" option displays a list of projects that others have

suggested that the CTC investigate. You are encouraged to call the CTC (or leave a message on the BBS) if one or more of the suggested projects sparks your interest. The "Add" option is there in case you have a suggestion for a future project. As project suggestions are received, they will be added to the list of suggested projects and others may indicate interest.

The CTC BBS plans to grow as requests for services from our users grow. Already there are discussions of adding various items to the list of options offered by the board. Such things as explanatory screens dealing with the RACT/BACT/LAER Clearinghouse and Information System and including editions of the CTC NEWS and the RACT/BACT/LAER Informational Flyer as downloadable items are being discussed. You, the user, can play an important part in this growth. If you have any suggestions for areas that the CTC BBS should include or specific ideas for new options on the board, please let us know. You can contact Joe Steigerwald at (919) 541-2736 or FTS 629-2736, or leave a note on the public message part of the CTC BBS detailing any ideas or suggestions you may have.

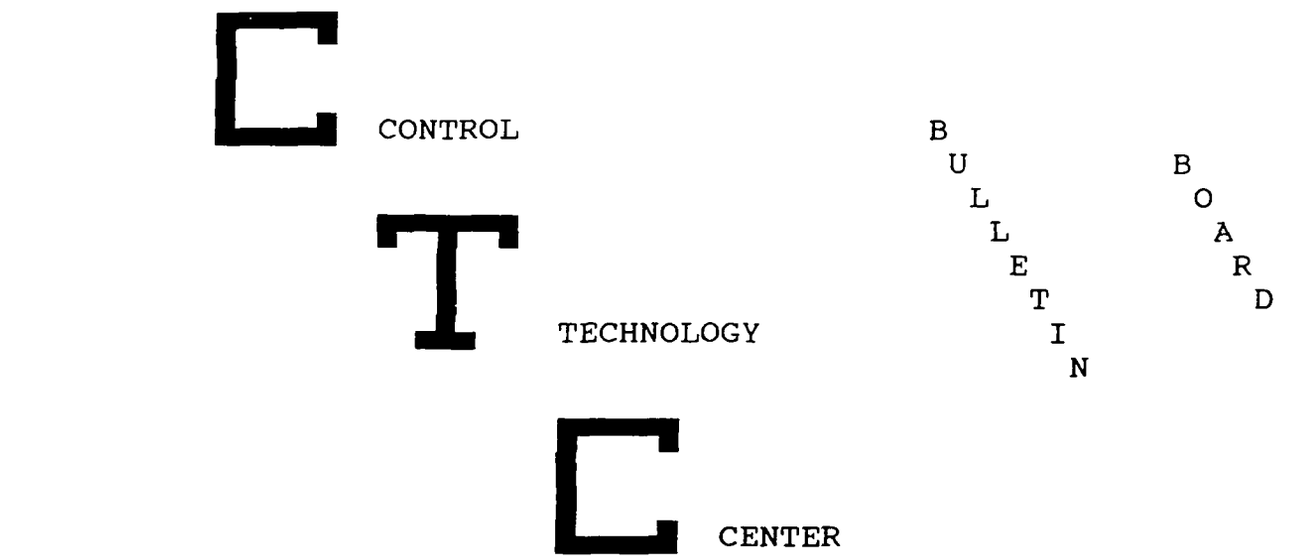


Figure A-1 The CTC BBS Welcome Screen

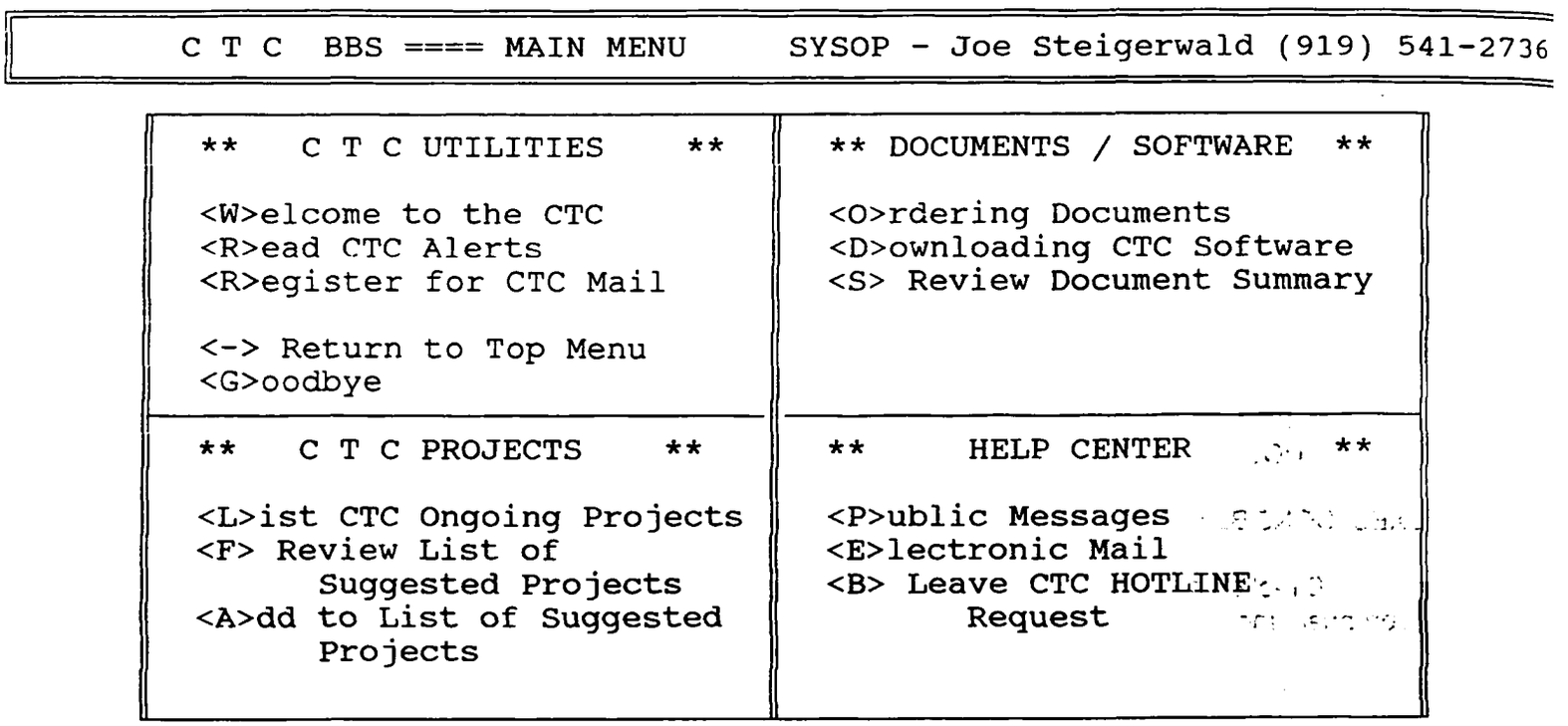


Figure A-2 The Main CTC BBS Menu Screen

APPENDIX B

RACT/BACT/LAER CLEARINGHOUSE

BACKGROUND

The RACT/BACT/LAER Clearinghouse was established to assist State and local air pollution control agencies in selecting reasonably available control technology (RACT), best available control technology (BACT), and the lowest achievable emission rate (LAER) controls for new or modified sources in a nationally consistent manner.

GOALS AND OBJECTIVES

The basic goals of the RACT/BACT/LAER Clearinghouse are to: (1) provide State and local air pollution control agencies with current information on case-by-case technology determinations that are made nationwide, and (2) promote communication, cooperation, and sharing of control technology information among permitting agencies.

CURRENT STATUS

The RACT/BACT/LAER Information System (BLIS) is user-friendly and available to all Clearinghouse users who have access to a PC equipped with communication software and a modem. Menus and help screens allow the user to search, view and print customized BLIS reports by entering the following command at the"ready" prompt on the National Computer Center's (NCC) IBM Computer:

EXEC 'CON5.BLIS'

Direct commands using the system 2000 language can still be made by selecting the appropriate menu option.

The 1991 edition of the RACT/BACT/LAER Clearinghouse publication is a supplement to the 1990 edition which was a 5 year compilation of data. This edition, "RACT/BACT/LAER Clearinghouse: A Compilation of Control Technology Determinations, First Supplement to 1990 Edition" (EPA 450/3-91-015), will be distributed to State and local air pollution control agencies in August 1991. It includes all determinations entered into the system since June 1990. Earlier determinations will continue to be available through BLIS and in the 1985 and 1990 compilation documents. State and local agencies may acquire additional copies free of charge by calling the Clearinghouse.

A new form for submitting new determinations to the Clearinghouse was introduced in the July 1990 publication. Information on the number of control options considered and the rank and cost effectiveness of the option selected has been added along with other minor changes. This new form should be used to submit new or revised determinations. If you need a copy of the form, call the Clearinghouse.

Because of changes at the NCC, BLIS must be moved to a new data base management system by FY93. As a result, the Clearinghouse is implementing a 2-year program to accomplish this change. Alternative hardware and software options are currently being evaluated and a new data base management system will be selected by the end of fiscal year 1991. The new system will be made operational by mid-summer, 1992. These changes provide the opportunity to improve and expand BLIS to better serve our clients. Suggestions and comments for improving BLIS are welcome. Just call the Clearinghouse.

The quarterly Control Technology Center News includes timely information on BLIS and New Source Review issues. The CTC News also addresses a wide range of emission and control technology issues.

EPA CONTACT:

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