



The ClearingHouse for Inventories and Emission Factors

CHIEF

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United States
Environmental Protection
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Office Of Air Quality
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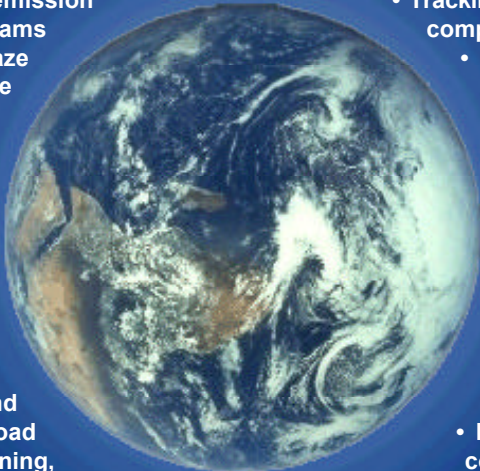
Call for Papers

The Emission Inventory: Living in a Global Environment

The international symposium, "The Emission Inventory: Living in a Global Environment" will be held December 8-10, 1998 at Le Meriden Hotel, New Orleans, Louisiana. This is the eighth annual symposium on emission inventories and is sponsored by the Air & Waste Management Association (A&WMA) and the U.S. EPA's Emission Factor and Inventory Group. Papers presented at the conference may also be submitted to the A&WMA for publication in the peer reviewed *Journal of the Air & Waste Management Association*.

The technical program will focus on papers that relate industrial experiences and concerns with inventories of air pollution emissions and the methods used to estimate emissions. The program will also consist of papers related to the improvement of the emission inventory process and utilization of emission data in global, national and regional control strategies. This conference will provide a useful forum for exchange of ideas and information on the use of emission data between industry, regulatory agencies, environmental professionals and the public. Topics from emission estimation methods to compliance reporting will also be covered.

Papers will be presented from the following topic areas covering criteria and regional haze pollutants and their precursors, toxic air pollutants, greenhouse gases and other non-traditional pollutants:



- Preparation of industrial emission estimates
 - Inventories as they relate to policy development and business decisions
- Regional and international emission programs
 - Regional Haze
- Implementing federal and state legislation
 - Inventory quality and uncertainties
- Compiling state regulatory emission inventories, including periodic inventories
- PM factors, emission models and inventories
 - Collecting and managing emission related data
- Motor vehicle emission: on road and off-road
 - Role of inventories in planning, industrial permits and trading programs
 - Biogenic/Agricultural emissions
- Spatial and temporal resolution of inventories
- Emission projections
 - Greenhouse gases
 - Global climate emission issues
- Tracking inventories for record keeping and compliance determinations
 - Acid rain emission issues
 - Air toxics emission estimates and inventories
 - Integrating and reducing emission reporting requirements
 - Air quality modeling inventories
 - Comparison studies of inventory and ambient data
 - Development and Improvement of emission factors and inventories
 - New developments in stationary source emission estimates
 - Electronic data processing and computerized tools
- Economic analysis and emission inventories
- Fugitive and Geogenic Emissions

Panel discussions related to the Emission Inventory Improvement Program, international, permit, trading programs and other inventory related developments are also planned. Continuing education courses and an exhibit of related products and services will be held in connection with the conference technical program.

Platform and poster presentations are invited. Send (by E-mail, mail, or fax) a 200-400 word abstract by June 5, 1998 to the Technical Program Chair: *Sharon Nizich, c/o Sally Dombrowski of the U. S. Environmental Protection Agency, MD-14, Research Triangle Park, NC 27711, Tel: (919) 541-0875, Fax: (919) 541-0684, e-mail: dombrowski.sally@epamail.epa.gov*. Include a complete mailing address, telephone and fax numbers, E-mail address, and an indication of whether platform or poster presentation is preferred. Unless otherwise noted, the first author listed will be assumed to be the primary author and will be the main contact for conference correspondence.

EFIG's Priorities for the New Year

David Misenheimer, Acting Group Leader, EFIG

A new year is upon us and as usual, things continue to change. Perhaps it would be boring to do the same things two years in a row, but one of these years I would like to try. While ozone has been the priority for the Emission Factor and Inventory Group the past several years, priorities for 1998 are: 1) PM Fine, 2) toxics, and 3) ozone.

With the new ambient air quality standards, we have the challenge of developing a full set of PM Fine emission estimation tools (emission factors, emission models, inventories, etc.) in a relatively short amount of time. Similar to ozone, emission estimates are necessary for PM Fine to support baseline assessments, control strategy development, and air quality modeling. Also similar to ozone, PM Fine air quality modeling must include precursor pollutants (ammonia, sulfur dioxide, and nitrogen oxides) in addition to direct emission of particulates. We will be focusing this year on initiating the development of emission factors/models and on beginning to firm up national emission estimates for PM Fine and precursors. This effort will include partnerships with other federal agencies as well as state and local agencies.

Second on our list of priorities is air toxics. Several activities are planned to improve our support for air toxic assessment projects within EPA and state agencies. Foremost is preparation of a 1996 emissions database for 188 hazardous air pollutants (HAPS). This will be the newest version of our National Toxics Inventory (NTI) and will represent a significant improvement over the current 1993 database. Some of the key activities for this year will be the addition of facility specific data and significant improvements/updates to the area and mobile source data. We will also be preparing improved documentation of the NTI methodologies and merging the data with our national criteria pollutant emissions database.

Third is ozone. Not that ozone has gone away, but relatively speaking, we are in good shape with our ozone related emission factors, estimates, and tools. One of the main activities for ozone is incorporation of the states' 1996 periodic emission inventory data into the National Emission Trends (NET) inventory. This will be a significant update to the NET, especially for point sources. We are also working on some improvements to consumer solvent emission factors and updates to a few AP-42 sections.

We expect this to be a very busy year with many challenges and with a high level of attention from users of emission estimation data and tools both within EPA and in other agencies. If you would like to hear more about our planned activities or would like to participate in efforts to improve data and/or tools for criteria and toxic emission estimates, you can contact me at misenheimer.david@epamail.epa.gov.

We Need Your Help!

The Emission Factor and Inventory Group (EFIG) is in the initial stages of developing a multimedia Computer Based Training (CBT) course for emission inventory preparation to be distributed on CD-ROM. The CBT is expected to be an introductory level course for state and local agency staff members who are new to the inventory preparation process. The focus will be on inventories of a local or regional nature, which are typically prepared for the purposes of developing State Implementation Plans (SIP).

EFIG is looking for state and local agency participants to assist and provide peer review during the development of the CBT. Also, EFIG would like to hear from those agencies that have similar introductory level training courses available in-house, and can provide examples of what is already working well. If you are interested in helping us by reviewing course material or providing additional information, please contact Info CHIEF at (919) 541-5285 or E-mail info.chief@epamail.epa.gov.

A Refresher Course for the 1996 Periodic Emission Inventory: Baseline of the Future

by Greg Stella, EFIG

As proclaimed in the title of this year's Emission Inventory Conference, we indeed are "Planning for the Future." State Periodic Emission Inventories (PEIs) for 1996 are required to be submitted to EPA by July 15, 1998 and soon will be considered the baseline of the future. Until now, emission projections have been developed from emissions collected during the 1990 estimation effort. This submission and collection program will soon become very important as the impact of past inventory projections and policy decisions will be seen almost immediately.

Background on the Periodic Emission Inventory

Several regulatory provisions are contained in the Clean Air Act (CAA) that direct the U.S. Environmental Protection Agency (EPA) to collect and maintain emissions inventory data. The CAA requires that state and local agencies develop periodic emission inventories for ozone nonattainment areas classified as marginal and above. These inventories must also be developed for carbon monoxide (CO) nonattainment areas classified as moderate or serious. Periodic emission inventories (PEIs) are required to be submitted to the EPA every three years as directed by the CAA Amendments of 1990 (CAAA). As outlined in the PEI guidance documentation, these inventories are due to EPA by July 15, 1998. EPA will review all data and provide comments back to the states by October 15, 1998.

All 1996 base year inventory information should be finalized by the states by January 15, 1999.



Because these inventories are used for several purposes, EPA is asking that emission inventories be submitted for areas other than those designated as nonattainment. These inventories will be used for policy decisions that affect entire states and state/local air pollution control agencies as well as the public. Local and national emission trends are tracked with these inventories and as transport becomes more and more of an issue, regional models use these inventories as input for air quality estimates in areas affected by emission transport.

Other Uses

EPA considers the 1996 PEI to be very important. Until now, data collected during 1990 has been projected to 1996 for state's emission estimates. Inventory data are collected from the states for a number of different purposes. Most are related to some aspect of a state's State Implementation Plan (SIP) for achieving and maintaining compliance with National Ambient Air Quality Standards (NAAQS). Others include monitoring the 15 percent rate-of-progress plans, determining whether emission caps are being maintained for attainment areas with maintenance plans that call for PEIs, and to track emissions relative to future reasonable further progress requirements. This 1996 PEI will offer all government agencies the opportunity to reestablish a more defensive emissions baseline. As new strategies are considered as a result of proposed standards for particulate matter (PM) and ozone, having solid emission estimates becomes extremely important.

Guidance for Inventory Preparation & Submittal

General guidance has been prepared to assist agencies in compiling their 1996 Periodic Emission Inventories. This information resides in two documents, both of which have been previously distributed to states and regional air offices in hard copy form and are now available on the web at <http://www.epa.gov/oar/oaqps/efig/ei/>. The Action Plan provides an overview of the process to be followed by state/local agencies and EPA.

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PEI (Continued from page 4)

The Periodic Emission Inventory Guidance Document contains more specific direction for developing and submitting an agency's inventory data.

The EPA's Emission Inventory Improvement Program (EIIP) guidance documents at <http://www.epa.gov/oar/oaqps/eiip/> contain "preferred and alternative" emission estimation methods for many different and specific types of source categories. While many of the more significant source types are addressed by this documentation, procedures for some sources have not yet been developed. In general, the preferred methods in EIIP are the most accurate and precise of the available estimation techniques and are practical enough to be accomplished by typical state/local agencies and individual facilities in terms of resources and staff.

National Emission Trends Files

Some agencies have expressed concern that their 1996 PEI would be difficult to prepare by the July 1998 submission date. Existing emission estimates compiled by EPA are available to be used as reference in compiling their 1996 PEIs. As of January 28, 1998, new National Emission Trend (NET) emission files were uploaded to the EPA's Periodic Emission Inventory FTP site. These files have improved emission estimates for all source categories, except mobile, and have improved stack and citing parameters for many point source records. NET files contain criteria pollutant emission estimates while the provided National Toxics Inventory files contain toxic pollutant emission data. Files can be downloaded from the EPA FTP site and access can be obtained by state and local agencies by calling the Info CHIEF Help Desk at (919) 541-5285, Monday through Friday, 8:30 am to 5:30 PM, EST.

Submission

Two inventory options and three data formats are available to agencies for their PEI data submissions to EPA. It should be clearly understood and certainly appreciated that EPA views state or local agency-derived data as preferable and likely to be of higher quality than NET data. Following suit, an agency's locally-derived data supplemented with NET data would then follow as the next acceptable emissions data. As an example, for some states, a reasonable use of NET data in a PEI would be to use some or all of the EPA-generated estimates for biogenics, on-road mobile and non-road mobile sources, rather than regenerating these estimates. However, unlimited verbatim use of NET data to fulfill PEI reporting requirements for large point sources and significant area source categories is not acceptable.

Agencies have three format options for submitting their data electronically to EPA. If an agency decides not to use any of the available choices, they are still required to submit their data in electronic form. If the agency's data are not in the EPA system, EPA generated data will be used to represent emissions for that area. Available formats for submitting data are AIRS/AFS, EIIP/EDI, and NET database format. Information on these formats and advice on how to use these for PEI submission can be found at <http://www.epa.gov/oar/oaqps/efig/ei/> or by contacting the Emission Factor and Inventory Group.

It is important to note that once emissions data are submitted electronically to EPA, they will immediately become available for public use. Agencies are urged to ensure their submissions contain the most accurate data available.

Summary

Data reporting is an essential part of the inventory process. A consistent reporting style allows for the data to be used effectively by the state in the future, shared with other states, transferred efficiently to the EPA, and makes it easy to compare and add to data that are already a part of EPA's inventories. Experiences over the last several years have shown the importance of quality emission estimates. The environmental protection community understands the importance of emission estimates in formulating good public policy. If the fundamental data used to derive control strategies are flawed, the policy resulting from the strategy will also be in error. These errors can be costly to the public being exposed, the industry subject to control, and the surrounding environment. While a defensible emission inventory will not solve all these problems, it will provide a solid foundation on which to begin creating public policy that meets all of society's needs.

The Future for Emission Factor Quality Ratings

by Ron Myers

Over the last few years, the meaning of the quality ratings associated with emission factors has been discussed both within EFIG and by outside groups. As a result, the emission factor team has begun a study to look at the options for revising these quality ratings. This article contains some information that is germane to this study and identifies some options that may be explored in the future. Also this article requests the readers to provide some opinions on the proposals and any additional ideas that could be evaluated.

First, we recognize that most users want an unambiguous emission factor value that they can use without question to estimate emissions from a single source or group of sources. However, we also recognize that these individuals do not have an appreciation for the potential for error in the application of this value. When we receive phone calls or letters advising us that a factor is wrong it is usually because they have a source that was recently tested that is half (or twice) the factor. They are surprised when they are informed of the range of values used to arrive at the average. A few people have also asked for quantitative information on various aspects related to emission factor uncertainty.

Emission factors are typically the arithmetic average of tests of a few non-random but hopefully unbiased selections from the source category population. Some factors are geometric means or medians of the available data. Most emission factors in AP-42 are assigned a quality rating from "A" to "E" by the developer. Although the basis for the rating is subjective, general criteria differentiate the ratings. The criteria include aspects of the quality of the supporting tests (compliance with reference test methods, precision and accuracy, and supporting documentation) and the quantity of supporting tests. An additional rating of "U" is given to emission factors that have not been evaluated either because no resources are available to evaluate them, we have little or no supporting data or because they cannot be evaluated. It should be recognized that the present factor rating is an imprecise measure of resistance of the factor to change with additional data. No information is provided to characterize the precision or accuracy of the emission factor, the variability of the underlying population, or the precision and accuracy of the resulting inventory.

A few difficulties are created by the present emission factor rating system. The lack of quantitative information on the uncertainty of emission estimates for the components of an inventory creates difficulty in formulating strategies for improving the inventory or identifying potential flaws. The lack of information on the confidence interval of the factor creates difficulties in identifying priorities for improving emission factors or activity data. Many people make inappropriate conclusions based upon the factor ratings. One such conclusion is that factors with equivalent ratings have equivalent precision and accuracy. Another equally inappropriate conclusion concerns the precision and accuracy for these ratings. For example, some comments have been made that "A" rated factors are $\pm 10\%$ in accuracy and that "E" rated factors are order of magnitude estimates.

It is our desire to provide an assessment system that is timeless with little subjectiveness. We would like to keep the information given to the majority of users as simple as possible but still provide an understandable assessment of quality. However, we would like to give users the information they require to assess the quality (precision, accuracy, variability, confidence interval etc.) of their emission estimate. Nevertheless, we want to keep the development of emission factors relatively uncomplicated. The information supplied should allow valid comparisons of the quality of emission factors between sources within an inventory.

A few options for what could be included in AP-42, the *FIRE* database and in the AP-42 background reports have been identified already. A few of the more viable options identified are:

- Eliminate all quality ratings. This is the easiest to implement, would reduce part of the burden of emission factor development, eliminate some controversies, and would not adversely impact most of the users of emission factors.

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Quality Ratings *(Continued from page 6)*

- Keep the existing system. This would result in no additional burden in developing the emission factor. However, it would continue the existing situation. To eliminate some personal judgements, more specific guidance could be developed on criteria to qualify for the different ratings.
- Eliminate the existing system and provide the number of supporting data and the sample standard deviation of the supporting data in both AP-42 and *FIRE*. This would result in some additional burden but provides additional semi-quantitative information for users. A variation of this option would be to add this information to the existing system. Despite the additional burden, this would provide semi-quantitative information and a link to past practices.
- Provide all summary statistics available in spreadsheet programs (count, arithmetic mean, standard deviation, max, min, median, geometric mean) with two of the above options. The introduction of AP-42 would need revision to explain how this additional information should be used.

It has been suggested that an estimate of the population distribution could be provided by determining the first and third quartile value and when sufficient data is available by determining the first and ninth decile value. Another suggestion is that a subjective assessment of the quality of the supporting data be provided.

In formulating the options for revisions of the emission factor quality ratings, discussions are being held with groups from EPA and state/local agencies. We have targeted groups that use emission factors in inventories, receptor models, risk assessments and operating permits. In addition, we are soliciting comments from other users of emission factors. To comment or provide support for what information would be most critical send a letter to the EFIG or E-mail Ron Myers at myers.ron@epamail.epa.gov.

Latest Trends Report Release

The *National Air Pollutant Emission Trends, 1900-1996*, EPA/454/R-97-011, December 1997, is now on our website at: <http://www.epa.gov/oar/oaqps/emtrnd>. This report presents the latest estimates of national emissions for criteria air pollutants: carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds, sulfur dioxide (SO₂), particulate matter (PM-10), and Lead. Data on air toxics, greenhouse gases, international emissions, and biogenics are also summarized in this report. The table below presents the 1995 and 1996 emissions for the pollutants mentioned above. A hard copy of the report will be available by March 20th. Please call Info CHIEF at (919) 541-5285 for a copy.

Table ES-1. 1995 and 1996 National Annual Emission Estimates for Criteria Air Pollutants (million short tons)

Pollutant	Emissions	
	1995	1996
Anthropogenic Emissions		
Carbon Monoxide	89.72	88.82
Lead (thousand short tons)	3.94	3.87
Nitrogen Oxides	23.94	23.39
Particulate Matter (PM-10)	26.89	31.30
Fugitive dust	22.82	27.23
Non-fugitive dust	4.07	4.07
Sulfur Dioxide	18.55	19.11
Volatile Organic Compounds	20.59	19.09
Biogenic Emissions		
Volatile Organic Compounds	32.74	29.25
Nitric Oxide	1.59	1.55

(Emissions of Hazardous Air Pollutants in 1990 were 4.40 million short tons.)

Tank Seals and Fittings Certification Program

by Dennis Beauregard, EFIG

The American Petroleum Institute (API), in collaboration with the Environmental Protection Agency (EPA), has developed a program to provide a reliable mechanism for establishing evaporative loss rates for storage tank components. Providing a reliable mechanism for establishing tank component evaporative loss rates is expected to promote the development and use of improved seals and fittings for fixed and floating roof storage tanks. Improved seals and fittings will tend to reduce volatile organic compound and hazardous air pollutant emissions from fixed and floating roof storage tanks and yield air quality improvements.



Over the years, testing of tank components has been conducted under the auspices of API and the results evaluated by EPA for inclusion in AP-42 and the *TANKS* model. The Tank Seals and Fittings Certification Program provides a mechanism for any party to conduct testing with the reasonable expectation that the results will be accepted by regulatory agency personnel.

Testing will likely be conducted for the following reasons:

- Emission estimates are currently generated using equations developed by API that are in Section 7.1 of AP-42 and the *TANKS* model. Inputs to the equations for tank seals and fittings were developed through evaporative loss testing conducted under the auspices of API. To characterize evaporative loss rates for various types of seals and fittings, equipment representing the type of design (e.g., mechanical shoe seal) was fabricated. Equipment designs were generic in nature but inclusive of features common to most vendor-specific designs believed critical to controlling evaporative losses. Evaporative loss rates developed through testing the generic component designs have been generally recognized by regulatory agencies when used to calculate fixed and floating roof storage tank emissions. The alternative of developing evaporative loss rates for vendor specific component designs has always existed but no ready means has been available for doing so.
- Sources regulated under the New Source Performance Standards (NSPS) for Storage of Organic Liquids, will now have a reasonable mechanism to utilize the “equivalency” provision of NSPS, allowing use of designs not strictly adhering to the equipment specifications within Subpart K. In the past, no established methods existed to evaluate the adequacy of new or different designs in achieving emission levels equivalent to designs that fully comply with Subpart K equipment specifications. The Tank Seals and Fittings Certification Program establishes the mechanism by which equivalency determinations can be conducted.

The API Tank Seals and Fittings Certification Program is composed of the following:

- **Test Methods:** several test methods have been developed to determine evaporative loss rates for specific categories of tank components (e.g., rim seals).
- **Loss Factor Development:** procedures have been established to ensure consistent handling of data and development of evaporative loss rates.

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- **Laboratory Certification:** requirements have been established for the design and operation of test facilities to ensure reliable test results.

Loss factors developed through the program may be submitted to the American Petroleum Institute for issuance of Certification Numbers. API Certification Numbers indicate adherence with all program requirements and provide assurance that the loss factors are credible.

To utilize information developed through the Tank Seals and Fittings Certification Program, EPA is evaluating modifications to the *TANKS* model which would prompt the user for API Certification Numbers when adding evaporative loss factors and “flag” new loss factors on emission reports. Compilations of loss factors that have been issued API Certification Numbers will be available through API and EPA (posting on the CHIEF website is anticipated).

EPA will periodically review activity under the Tank Seals and Fittings Program to assess the need for adding new loss factors to AP-42 and the *TANKS* model. New loss factors having wide application would be logical candidates for publication in AP-42 and addition to updated versions of the *TANKS* model.

Manufacturers of tank components are expected to be the primary customers for this program. However, it will be operated on a fee basis and will be open to all parties with a desire to establish evaporative loss factors for vendor-specific component designs.

Questions regarding this program should be directed to Dennis Beauregard of the Emission Factor and Inventory Group at (919) 541-5512 (E-mail: beauregard.dennis@epamail.epa.gov) or Jason Beckstrom of API at (202) 682-8147 (E-mail: apitsf@api.org).

The screenshot shows a web page with a dark blue sidebar on the left containing navigation links: Office of Air Quality Planning & Standards, CHIEF, EIIP, 1996 EI, Air Toxics, OMS, TTNWeb, AP-42, Trends, Office of Air & Radiation, Search OAR, and AIRLinks. The main content area has a light blue background with a repeating 'EPA' watermark. At the top center is the EPA logo and 'United States Environmental Protection Agency'. Below this is a large graphic with the EPA seal on the left and the text 'Emission Factor and Inventory Group' in large blue letters. Underneath the graphic is 'Office of Air Quality Planning and Standards'. At the bottom of the main area are three buttons: 'ABOUT EFIG', 'ABOUT LINKS', and 'INFORMATION'.

<http://www.epa.gov/oar/oaqps/efig/>

Info CHIEF's Most Frequently Asked Questions

Call (919) 541-5285 or E-mail info.chief@epamail.epa.gov
if you have questions!

Q: I would like to keep my hard copy of AP-42 up to date, but the last time I called GPO, they did not have it in stock. How can I get a hard copy of AP-42 Supplement C?

A: Unfortunately, the printing of AP-42 Supplement C was delayed, but it is now available from the Government Printing Office (GPO) for \$9.00. To order, call GPO at (202) 512-1800 and request Stock Number 055-000-00587-7. Supplement C sections are also available on the CHIEF website (<http://www.epa.gov/ttn/chief/>), on Fax CHIEF (call 919-541-5626 or 541-0548 from your fax machine), and on the *Air CHIEF* CD-ROM which is available from GPO (Stock No. 055-000-00580-0).

Q: I have recently upgraded from TANKS 3.0 to TANKS 3.1 and I would like to combine the tank data into TANKS 3.1. Is there a way to do this?

A: Yes. Both versions 3.0 and 3.1 of *TANKS* allow you to merge data. Since there have been few changes to *TANKS* 3.1 from the previous version, it is relatively easy to merge the data from *TANKS* 3.0 into *TANKS* 3.1. To do this, simply select "Database Utilities" from the *TANKS* 3.1 Main Menu. Under "Database Utilities", choose the "Merge Data" option. This option will bring up a window which prompts you for the two data directories and the two system directories to be merged. Type in the directories for *TANKS* 3.1 in the "Directory 1" option (this should appear as the default) and then type the directories for *TANKS* 3.0 in the "Directory 2" option. When you have finished, hit the "CTRL" key and the "END" key on your keyboard to save and merge the directories.

Q: I just downloaded the TANKS 3.1 software and tried to install it onto my computer. However, when I try to run the program, I get a screen that says "Exiting TANKS software". Why is this happening?

A: If you have followed the installation instructions correctly (e.g. exiting *Windows*® and installing under DOS), then you may have a virus scanning software running on your system that interferes with the installation process. We have recently discovered that some virus scanning software programs apparently treat the *TANKS* installation like a virus program and prevents the *TANKS31.EXE* file from being installed. To correct this situation, disable your virus scanning software during the installation process.



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The *CHIEF* Newsletter is produced quarterly by the Emission Factor and Inventory Group; Emissions, Monitoring, and Analysis Division; of EPA's Office of Air Quality Planning and Standards. Its purpose is to enhance communication within the emission factor and inventory community by providing new and useful information and by allowing for the exchange of information between and among its readers. Comments on the Newsletter and articles for inclusion in it are welcome and should be directed to Emission Factor and Inventory Group (MD-14), US EPA, Research Triangle Park, NC 27711; telephone (919) 541-5285.

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