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**REPORTING GUIDANCE FOR
1996 PERIODIC EMISSIONS INVENTORIES AND
NATIONAL EMISSION TRENDS (NET) INVENTORIES**



**REPORTING GUIDANCE FOR 1996 PERIODIC EMISSION INVENTORIES
AND NATIONAL EMISSION TRENDS (NET) INVENTORIES**

FINAL

Issued By:

Emission Factor and Inventory Group
Emissions Monitoring and Analysis Division
Office Of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

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1.0 PURPOSE OF GUIDANCE

1.1 INTRODUCTION

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. 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). This guidance document is designed to communicate EPA requirements for the reporting of emissions inventory information for two such inventory programs - the 1996 Periodic Emission Inventories (PEIs) and the National Emissions Trends (NET) inventory. After a brief description of the PEI and NET inventory programs below, the purposes and objectives of this reporting guidance are detailed (Section 1.2), EPA expectations of the states on reporting are identified (Section 1.3), overlaps between the PEI and NET inventories are discussed (Section 1.2), and the impacts of proposed upcoming changes to air quality management in the SIP process and the role of inventories are summarized (Section 1.4). Schedule considerations are summarized in Section 1.5. Lastly, the organization of the remainder of the guidance document is explained (Section 1.6).

The Clean Air Act [under Section 187(a)] requires that state and local agencies develop periodic emission inventories for ozone nonattainment areas classified as marginal and above. The Clean Air Act [under Section 187(a)] requires that state and local agencies develop these inventories for carbon monoxide (CO) nonattainment areas classified as moderate or serious. The purposes for which PEIs may be used 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. PEIs are to be submitted to the EPA every three years. The

1993 inventory was submitted in 1995. The 1996 PEIs are to be submitted to the Agency no later than November 15, 1998.

Clean Air Act Sections 110(a) and 172(c) also give the Agency authority to require inventory data from the states for SIP development purposes. Section 172(c)(3) provides EPA with discretionary authority to require emissions data as deemed necessary for SIP development to meet the NAAQS. Under Section 110(a)(2)(F)(ii) of the CAA, states are required to provide criteria pollutant emissions information under general SIP requirements. Much of the inventory information collected through these means has been compiled by EPA into a national repository database known as the National Emissions Trends (NET) system. This inventory will compile data to track the trends of air emissions, deposition, quality and visibility impairment, and to ensure the comparability of air quality data collected in different states and obtained from different nations.

The NET inventory contains the U.S. EPA's latest estimates of national emissions for criteria pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOC), sulfur dioxide (SO₂), particulate matter less than 10 microns (PM-10), and total PM. Non-criteria pollutants included in the inventory are hazardous air pollutants (HAPs), particulate matter less than 2.5 microns (PM-2.5) and ammonia. Estimates are contained in the inventory for the years 1900 to 1996, with increasing levels of detail in the more recent years. For the purposes of the inventory, EPA makes annual emission estimates based on statistical information about each emitting source category, emission factors, and control equipment efficiencies. The estimates are made for over 450 individual source categories that include all major sources of anthropogenic emissions. The 1996 NET inventory will include state-submitted inventory data generated for the Ozone Transport Assessment Group (OTAG) and Grand Canyon Visibility Transport Commissions (GCVTC) and other inventory services. The NET inventory, however, does not necessarily include state data for any particular source or pollutant. The 14 major source types for which emissions are presented are: fuel combustion-electric utilities, fuel combustion-industrial, fuel combustion-other, chemical and allied products manufacturing,

metals processing, petroleum and related industries, other industrial processes, solvent utilization, storage and transport, waste disposal and recycling, on-road vehicles, non-road sources, natural sources, and a miscellaneous category (e.g., agriculture, wildfires, cooling towers, fugitive dust, accidental releases, etc.).

To support the 1996 emission inventory efforts, the EFIG has established the 1996 **Emission Inventory Home Page**. The home page serves as a central information source for the preparation of the 1996 emission inventories and the submission of the data to EPA. It is the source of the most current information and should be consulted for updated information. Major headings on the home page are:

- Background
- Guidance Documents for Preparation of the 1996 Emission Inventory
- Data Submission
- Frequently Asked Questions (FAQ)
- Emission Trends Data
- Regional Office Emission Inventory Contacts
- Emission Factor and Inventory Group Contacts (EFIG)
- What's New?
- Where To Ask For Help
- Public Forum

The Address for the home page is : <http://www.epa.gov/oar/oaqps/efig/ei/>. Additional information is available through the Info CHIEF Help Desk at: (919) 541-5285.

To recap the planned EPA approach regarding NET inventory data (contained in the January 1997 guidance document Action Plan for Submittal of 1996 Periodic Emission Inventories and Review of NET Inventory Data²), EPA intends to provide statewide 1996 emissions inventory data on a county level basis to every state in the country. These data will be

provided such that they are available at the same time states will be in the process of PEI development. Receiving all states' review and feedback on the NET data is extremely important to the EPA. The NET inventory data can be very useful and beneficial to states for several purposes including: aiding in the compilation of the 1996 PEI, providing the state with a comprehensive (including better pollutant coverage) emissions inventory, providing a starting point for a statewide toxics inventory, providing data for more expanded air quality dispersion modeling analyses, and helping in characterizing boundary conditions for nonattainment areas. Obtaining state review and comments on the NET data is a major goal of this process.

1.2 PURPOSE OF THE GUIDANCE

The EPA is issuing this guidance document to communicate requirements and enhance states' understanding of the types of emissions inventory information they should be reporting to EPA in connection with the 1996 PEIs and their review of 1996 NET inventory data. The document specifically presents the individual data elements that EPA wants to have reported in each state's 1996 PEI for point, area, mobile (onroad and non-road), and biogenic source types. In addition to identifying these elements, the guidance also discusses the options available to a state for electronically providing the necessary inventory data to EPA. As has been recently communicated to states in other guidance², EPA will not accept paper copy-only submittals of 1996 PEI data.

EPA Regional Offices will have the primary responsibility for inventory review and approval. State and local agencies should contact their Regional Office (RO) early in the inventory process to identify any additional reporting requirements.

The EPA is implementing changes in the CAA Section 110 regulation on SIP procedures and requirements (discussed in greater detail in Section 1.4 of this document). One aspect of these changes will be to increase the significance of the central national database that EPA is building in the form of the NET inventory for future national air quality management policy.

Many of the general reporting requirements associated with PEI data and NET inventory data are the same due to the large amount of overlap between the two data sets. Because of these reporting changes, the increased importance of the NET inventory review by the states, and the similarities between the two inventories, reporting requirements for the PEI and NET inventory submissions are being provided together in this document. However, more information will be needed for the statewide NET inventory data sets because of the uses these data will have in regional air quality modeling and attainment planning (see Section 1.4).

To be effective and useful, inventory data must be reported in a manner that allows an organization, other than the preparing agency, to perform thorough quality review of the data and to apply the data to address various air quality management needs (modeling, control strategy development, emissions trading, etc.). The data must be understood and used by EPA, other states, other agencies, and the public. As EPA moves more towards a regional focus in addressing air quality issues, there will be more pressures on states to share their inventory data with other groups. States are encouraged to plan, document, and store their inventory information with this in mind and in a manner that allows for efficient reporting, sharing, and use

The goal of this guidance is to identify the key reporting data elements and present them in a manner that is clear and streamlined. By doing this, EPA will be able to achieve better national inventory consistency and completeness, to support regional air quality planning and attainment. This guidance material will also assist the EPA Regional Offices as they assume greater responsibilities for inventory review and approval. The decentralization of the inventory review process means that minimum acceptable reporting standards should be followed.

Lastly, one of the goals of this reporting guidance is to highlight the overlap and similarities of the reporting requirements applicable to the 1996 PEIs and statewide NET inventory data. States should make every effort to take full advantage of the ability to coordinate both the inventory development and reporting aspects of the PEI and NET inventories, and other

emissions reporting programs such as emission statements and annual statewide reports for major sources. The coordination of these efforts will reduce the overall reporting burden and save resources.

The primary components of the PEI and NET inventories are listed for comparative purposes in Table 1-1. The most significant differences between the two are the number of pollutants included (and consequently the number of source categories potentially included) and the number of distinct point sources addressed due to differences in point source thresholds. The NET inventories have many more pollutants in them beyond the PEI nonattainment pollutants (VOC, NO_x, and CO); therefore, additional source categories will be present that are not part of the PEI development and reporting effort. The NET inventory point source thresholds are determined by the emissions data source used, and will vary depending on the point source thresholds of the data source. If a state collects data for all facilities emitting more than 5 tons of VOC per year, and that data has been incorporated into the NET inventory, then the threshold for VOC in that state will be 5 tons per year. The NET documentation can provide information about what source of information were used for point source emissions, and users can then determine the thresholds for NET inventory point sources in their state.

Another difference between the NET and PEI inventories is the application of rule effectiveness (RE) for point and RE and rule penetration (RP) for area sources. In previous inventory efforts, RE and RP have not been uniformly applied. RE and RP are required for inventories for non-attainment areas and the PEI. RE and RP are not included in the NET calculations, except for some utility point sources. Regional offices will take primary responsibility to define policy for using RE and RP. States should contact their RO for guidance on this issue early in the inventory process. More information about RE and RP policy is available on the OAQPS emission inventory Web site, listed in Section 1.1 of this document.

For common pollutants and source categories between a PEI and an NET inventory, the overlap between required core data elements will be extensive. The tables in Chapter 2 clearly

TABLE 1-1. COMPARISON OF PRIMARY COMPONENTS IN THE 1996 PEIs AND NET INVENTORIES

| Data Element | Periodic Emission Inventories | National Emission Trends Inventory |
|------------------------------|---|---|
| Geographic Coverage | Designated nonattainment (NA) areas | Statewide, entire US |
| Pollutants | VOC, CO, NO _x | VOC, CO, NO _x , SO ₂ , PM-10, PM-2.5, HAPs, Ammonia |
| Sources | Stationary Point Sources Stationary Area Sources Onroad Mobile Sources Non-road Mobile Source Biogenic Sources (Trees, agricultural crops, soils) | Stationary Point Sources Stationary Area Sources Onroad Mobile Sources Non-road Mobile Source Biogenic Sources (reported separately in Fall 1997) Geogenic Sources |
| Point Source Size Thresholds | Ozone NA Areas: VOC ≥ 10 tpy NO _x ≥ 100 tpy CO ≥ 100 tpy CO NA Areas: CO ≥ 100 tpy Source emitting ≥ specified tpy characterized as point sources Source emitting < specified tpy are combined and reported as area source category | Thresholds for all pollutants may vary from state to state. See the discussion in the text. |
| Spatial Resolution | <ul style="list-style-type: none"> Stationary Point Sources: estimates by Lat/Long or UTM coordinates Stationary Area Sources: county level Onroad Mobile Sources: county level Non-Road Mobile Sources: county level Biogenic Sources: county level | <ul style="list-style-type: none"> Stationary Point Sources: estimates by Lat/Long or UTM coordinates Stationary Area Sources: county level Onroad Mobile Sources: county level Non-Road Mobile Sources: county level Geogenic Sources: county level |
| Temporal Resolution | Annual and seasonal daily emissions | Annual and seasonal daily emissions |
| Inventory Year | 1996 | 1996 |

- HAPs includes 37 pollutants EPA is focusing on in its National Toxics Inventory. The 37 are toluene, POM, benzene, formaldehyde, xylenes, 1,3-butadiene, tetrachloroethylene, trichloroethylene, acetaldehyde, acrolein, methylene chloride, hydrazine, glycol ethers, styrene, arsenic compounds, chloroform, nickel compounds, lead compounds, manganese compounds, ethylene dichloride, bis(2-chloroethyl) ether, cadmium compounds, acrylonitrile, ethylene oxide, vinyl chloride, chromium compounds, diphenyl methane diisocyanate, mercury compounds, 2,4-toluene diisocyanate, antimony compounds, ethylene dibromide, acrylamide, beryllium compounds, phosgene, 2,3,7,8-TCDD, 2,3,7,8-TCDF, and coke oven emissions. In terms of POM data, states need to clearly identify how they define POM and what species are included in the POM estimate.

illustrate this. The most significant reporting aspects of the NET data are in the broader array of pollutants and source categories covered.

1.3 STATE'S ROLE IN THE NET INVENTORY

1.3.1 Review of the NET Data

Each state is being asked to review the NET data provided by the EPA and to augment and improve the data in the NET with the state's inventory data prepared as part of the 1996 PEI and other inventory efforts. EPA hopes that this review by the states will be a significant step towards validating the accuracy of the NET inventory and increasing the pollutant and source coverage contained in the NET system. The states are expected to gain data that may be used to fill gaps currently existing in their inventories, enhancing the chances of getting a successful 1996 PEI process. The NET data are not being provided to relieve any state agency of its obligations under the CAA to prepare and submit a 1996 PEI that represents their best estimate of actual emissions for that year. The NET data are not to be simply sanctioned by a state as its data for the purposes of the 1996 PEI requirement and returned to EPA.

The EPA wants state and local agencies to review and compare the NET data to their existing equivalent data (PEI or other state inventory) for the same sources and pollutants. If the state determines that its current information for 1996 is of higher quality (based on any number of factors), EPA wants to obtain these data from the state so that the NET inventory can be revised. In these cases, the state should coordinate any exchange of inventory data for NET updating purposes with the EPA's Emission Factor and Inventory Group (EPA/EFIG). If the data are applicable to the 1996 PEI, they can be provided through the regular PEI information transfer paths discussed in Chapter 3. Other (non-PEI) data can be supplied directly to EPA/EFIG for NET inventory updating purposes. Similarly, if upon review the state determines it has additional pollutant and/or sources data beyond that in the NET data set, EPA would like to obtain these data as well. The goal is to obtain all state inventory data, for as many sources and

pollutants, that the state has available. A state will make two data submissions under this process: one data submissions of improvements to the NET inventory, and the submission of the PEI data. States must remember to update both data sets when inventory's data changes.

A state may decide to simply send a replacement data set based on their PEI to overwrite all of the comparable NET data. This may or may not be accompanied by any review of the NET data. This is also an acceptable response, and so long as the state's data are sent in a format which can be transferred into the NET database (see Section 3.2).

The EPA also desires to have each state identify and provide additional data they may have for their state in terms of increased pollutant and/or source coverage. For example, a state may receive the NET data for VOC and NO_x emissions and upon review find that the data are the same as what the state has. The state also, however, may have developed data for the source for PM-10, PM-2.5, and ammonia. As a part of the 1996 PEI process, EPA would like to obtain the added data a state may possess for sources already in the NET system, and data for sources not in the NET inventory. This need extends as well to other non-criteria data such as toxics and PM-2.5.

In each case, the criteria data (VOC, NO_x, CO, PM-10) are of top priority, but if possible, EPA would like to receive, through the NET distribution and review process, whatever data the state has for other criteria pollutants (SO₂), toxics, and other pollutants including ammonia, and PM-2.5. The rationale for this request is that if a state has information on VOC, NO_x, and CO emissions from a source, it should not be a significant additional burden to ask the state to report the estimates available for all pollutant species. If a state has information that indicates the NET data are missing entire sources, EPA would want to know this. It is EPA's goal that the NET inventory contain data for all states, addressing all source categories, and quantifying as many pollutants as possible (see pollutant list in Table 1-1).

States should take this opportunity to identify source categories that are larger contributors to their inventory and that had emissions estimated using advanced or more detailed methods than those used for the NET data. Priorities in comparing NET and PEI data should be defined based on the state's knowledge of the strengths of their own inventory efforts. However, some data in the NET for significant emission sources or source categories such as utilities, large industrial facilities, and biogenics already have a reasonably high confidence level, and should not need extensive review.

States should also review NET data for instances of double counting. When point source data and area source emissions from a state has been drawn from two different data sources, then potential double counting of emissions can occur when a process is inventoried as both point and area sources.

A final priority for NET data review are those pollutants and source categories which have the lowest confidence level attached to them: emissions of ammonia, solvent use sources, area source emissions, fugitive dust emissions, and data gaps in supporting data. The NET inventory supporting documentation and cover letter discuss these areas of special concern in more detail. Information about the methods used to generate NET emission data can be found on the NET Web site, listed in Section 1.1 of this report.

States need to be fully aware that all emissions inventory data that are submitted to EPA for PEIs for the NET inventory will be made publicly available. Data could be placed on an FTP site and made accessible through the Internet, placed on EPA electronic bulletin boards, distributed through CD-ROM, or distributed in printed reports. States should, therefore, not submit any confidential information to EPA as a part of this process because EPA will not have any provisions for dealing with this information and treating it differently as confidential data. Any PEI or NET information provided by states is subject to full public disclosure.

1.3.2 Using NET Data in 1996 PEI Development

The NET data will be provided to a state agency for the whole state. It is hoped that in addition to potentially being an aid for the nonattainment area PEI, it may be useful for gap filling in attainment areas where the state may not have obtained sufficient inventory estimates. For example, due to the differences in reporting, inventorying, and permitting requirements between attainment and nonattainment areas, small industrial and small utility sources in attainment areas may not have been that well addressed. The NET data may help fill in data for such source types if the state agency feels the data are valid. This application could be very useful in compiling the inventory data needed for the Regional Air Management Partnerships (RAMPs) being formed as a function of changes to the SIP program (see Section 1.4). State agency review of the data will be required to make these determinations.

The point should be clearly understood and appreciated that EPA views state or local agency-derived data are preferable and likely of higher quality than NET inventory data. Where a state or local agency has emissions estimate data for its area(s) (attainment or nonattainment), these data would supersede comparable data EPA may have in its NET database for the same area(s). It is EPA's intent that the process of making the NET data available is a mutually beneficial undertaking. It is hoped that by having the NET data, the state/local agency can be more timely with data submittals and can save some resources in the required process to generate a 1996 PEI.

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, onroad mobile and non-road mobile sources, rather than the state re-generating these estimates. However, unlimited verbatim use of NET data to fulfill 1996 PEI reporting requirements for large point sources and significant area source categories is not acceptable. A clear benefit of using NET data for some of the inventory needs (where appropriate) would be that additional state resources would be made available for more rigorous treatment of point and area sources. For instance, use of the point source data

could be a starting point for a more in-depth point source inventory conducted by the state in an attainment area.

1.4 IMPACT OF PROPOSED CHANGES TO CAA SECTION 110 PROVISIONS

Under the provisions of the Federal Advisory Committee Act, the EPA has formed an advisory committee under the Clean Air Act Advisory Committee to obtain advice and recommendations on integrated approaches for implementing revised NAAQS for ozone and particulate matter, as well as a new regional haze program. This group, known as the Subcommittee for Development of Ozone, Particulate Matter, and Regional Haze Implementation Programs, contains 58 members and functions with five work groups. One of these groups, the National and Regional Strategies Group (NRSG), is responsible for the development of broad regional and/or national strategies for addressing air pollutant transport issues. The reader is reminded that the changes to the CAA being discussed here are not final at the time of this writing, and the final version of the changes may be somewhat different from those discussed here.

More detailed information on the Clean Air Act Advisory Committee and the NRSG and these groups' programs can be found on the Technology Transfer Network (TTN) Internet Web Site for FACA at <http://134.67.104.12/html/o3pmrh/faca.htm#FA01> . The address for the more general TTN Web Site is <http://ttnwww.rtpnc.epa.gov/> .

The efforts of this FACA group have produced recommendations to EPA that will result in significant changes in how air quality management for NAAQS is planned and achieved in the United States. The proposed changes have been developed to coincide with the promulgation of revised NAAQS for ozone and PM in the summer of 1997. The NRSG has made recommendations that EPA is implementing that will involve changing some of the current CAA Section 110 regulations on SIP procedures and requirements. The changes will alter the need for future PEIs and greatly increase the significance of the central national inventory database EPA

is trying to build in the form of the NET inventory. The core of the SIP process changes revolves around the adoption of a regional instead of localized (i.e., individual nonattainment area) strategy to solve NAAQS nonattainment problems. The model for the recommendations of the NRSG has been the work of the Ozone Transport Assessment Group (OTAG).

The initial changes to CAA Section 110 will take place in what is known as the Phase I Implementation. In Phase I, the entire country (exclusive of Alaska and Hawaii) will be divided into Regional Air Quality Management Partnerships (RAMPs). RAMPs will define the fundamental spatial areas in which air quality management will be carried out. The formation of RAMPs will be undertaken by combining technical and political considerations in the identification of areas which have common air quality characteristics and share common air quality concerns. Technical considerations may include anticipated air quality and haze problems, meteorology, and emissions density. Political considerations may include the existing institutional structures [e.g., groups such as the Ozone Transport Commission (OTC), Lake Michigan Air Directors Consortium (LADCO), etc.] and the desires of individual states and Indian tribes.

All states (except Alaska and Hawaii) will be placed into a RAMP. If a state requests, it can be assigned to more than one RAMP; however, no state will be required to be in more than one RAMP. The placement of a state or tribe in a RAMP does not require that state to participate in the activities of the RAMP. However, the RAMP will include all of the area within the RAMP boundaries in the air quality management work which it undertakes, and it may make recommendations and establish policies and procedures which affect the nonparticipating states and tribes. It is anticipated that 3 to 10 RAMPs will eventually be created. More information and current developments on RAMP creation can be found at the FACA Web Site referenced above.

As a part of the Phase I Implementation, states with existing NAAQS nonattainment areas will be expected to compile and submit to EPA a 1996 PEI. This inventory will serve as a

component to a larger inventory each state within a RAMP will be expected to have. New or re-designated nonattainment areas (based on air quality data) will fall under the full provisions of the Phase I Implementation and the changes that are being implemented in CAA Section 110 affecting the SIP program. Once the RAMPs are established, several activities will be initiated that affect and influence the creation of emission inventories.

At their onset, the individual RAMPs will determine what will be known as Areas of Violation (AOVs) of the NAAQS within their RAMP. These determinations will be made using ambient air quality monitoring data. Once the AOVs within a RAMP are specified, there will be a need to define the Areas of Influence (AOIs) that are contributing and causing the violations. In addition, AOIs may also be identified for regional haze issues and planning. The EPA, in conjunction with the Science and Technical Support Work Group, will issue technical guidance that the RAMPs will use to make AOI determinations. It is possible that a RAMP could identify areas outside of its boundaries as possible AOIs to their AOVs. A more thorough treatment of the issues surrounding AOV and AOI determination is available at the FACA Web Site.

Emission inventory data will be used in conjunction with air quality models and other information to determine the preliminary AOIs for a RAMP. The EPA intends to use the data from the NET inventory database, compiled after initial review by the states, as the inventory data to be used in the air quality models used for the preliminary AOI analyses. The EPA plans to maintain the NET inventory as the central emissions data repository for air quality assessments that the RAMPs will have to perform to determine their appropriate regional management strategies. Having a central system of this type for all RAMPs will facilitate data sharing between RAMPs and provide for information of more consistent quality.

With the creation of RAMPs and the use of statewide inventory data for modeling and preliminary AOI determinations, thorough state review and improvement of the NET inventories is crucial. The inventory data and corrections to the NET inventory that each state is being asked to provide to EPA by July 15, 1998 will be a key component to the Phase I Implementation

process as envisioned by EPA and the FACA subcommittees. The final NET data set that EPA will produce for each state in 1998, will be provided directly to the appropriate RAMP for use in RAMP air quality management activities. The inventory reporting requirements presented in this guidance document reflect this intended use of the inventories. For example, stack emission parameter data (stack height, stack diameter, temperature, etc.) are specified for point sources to facilitate modeling.

In the second phase of implementation, projections of the base year inventories will also be used by the RAMPs to estimate future year air quality conditions using modeling. The projected concentrations will be used to formulate strategies for the RAMP and determine the necessary emission control options to meet the NAAQS by the required attainment date. The control strategies and plans will be compiled into a document known as a Regionally Integrated Plan (RIP). All of these intended uses of the NET inventory data serve to increase the importance and urgency that states should place on performing a detailed review of the data for their areas. The information states provide back to EPA on the NET data will form the starting point for RAMP air quality evaluations.

1.5 REPORTING SCHEDULE

Emission inventory information required from states for the 1996 PEI and requested in regards to the NET inventory, are scheduled to be reported to the 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.

The July, 1998 submittal date would include having all information available electronically, in one of the data transfer formats presented in Chapter 3 of this document. As a part of meeting the July 15, 1998 date for the total inventory, state and local agencies are encouraged to submit their inventories by component (e.g., point source data, area source data, etc.) prior to July 15th if possible. For example, point source data may be submitted in April,

area data in May, and mobile source data by June. This would leave some time before July 15th to finish up any missing information and fully quality assure the data. Early submittal is certainly not a requirement; however, EPA is very willing to receive submittals of completed portions of a state's inventory early and begin the review process. Early submittals of inventory components are encouraged for both the PEI and the state review/response to the NET inventory.

1.6 ORGANIZATION OF GUIDANCE REPORT

The remainder of this guidance document is structured as follows. Chapter 2 contains a presentation of the specific data elements for all source types that EPA desires to have reported as a part of the states' 1996 PEI submittals. These reporting requirements represent the data that EPA requests be available in electronic format, as well as any paper copy materials a state may provide. Reporting needs are also specified for the data EPA would like states to provide to support the NET inventory process. Chapter 3 provides an overview of the primary methods EPA would like states to use to electronically report their inventory information. Chapter 4 provides the reader a general summary of the minimum expectations EPA has for the documentation of all inventory data submittals. Chapter 5 discusses the preferred source of inventory procedural guidance. Chapter 6 contains a reference list of materials cited in this guidance.

2.0 DATA REPORTING REQUIREMENTS

2.1 PURPOSE

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 easily comparable with, and added to, data that are in the NET. It is for this reason that data reporting requirements are defined. Data that are missing the recommended elements, that are not compiled in a manner that can be compared to other state's data or that can be compared to the data in the NET, may not be able to be used by a RAMP for air quality analysis. The value of data consistency within a RAMP is explained in Section 1.4. NET data will be used for missing data or inventory data that could not be loaded into the NET. This chapter will present the specific data elements EPA would like to have provided for both the 1996 PEI and the NET data updates.

Detailed source data are the data elements applicable to a specific source category, facility, emission point, or unit process. Once they are compiled into a national database, detailed source data are used to perform the analyses needed to set ambient air quality standards, for air modeling efforts, to track progress in meeting CAA requirements, and to answer questions from state and local agencies and the general public. Summary data for inventories compile the detailed data into a report that can be used to compare estimated emission levels of pollutants between categories and between inventory areas. This chapter will define both detailed and summary reporting requirements as developed by EPA.

This chapter contains a discussion of NET data review by states (Section 2.2) and a presentation of the specific data elements for all source types that EPA desires to have reported as a part of the states' 1996 PEI submittals and as additions to the NET inventory. Detailed reporting requirements for the PEI and the NET data are discussed in Section 2.3 by source type

(point, area, onroad mobile, non-road mobile, and biogenic sources). Summary data reporting requirements are discussed in Section 2.4.

2.2 NET DATA REVIEW PROCESS AND PRIORITIES

The EPA plans to provide all state and local agencies with NET system inventory data for their areas on a county level basis. In cases where the state/local agency identifies mistakes or problems with the NET data, EPA would like to have these findings communicated to them as a part of the 1996 PEI process. EPA wants to know and understand when the state/local agency believes its data are more accurate, more complete, or more representative of emissions as compared to the NET information. EPA prefers to have the state/local agencies conduct a full review of all the NET inventory information; however, the EPA realizes this may not be feasible for every state. Each state and their RO will have to define priorities for review of the NET data. See section 1.3.1 of this document for a discussion of review priorities.

2.3 DETAILED REPORTING REQUIREMENTS

Detailed reporting requires the specification of data elements applicable to a source category, facility, emission point, or unit process. These are the data elements required to calculate the emission estimate and adequately characterize the source, and those that are needed in order to use that estimate in an air quality model.

Differences and similarities between the PEIs and NET inventory have been reviewed in Chapter 1 and Table 1-1 of this guidance document. The most significant differences are the NET inventory's coverage of an entire state, in comparison with only nonattainment areas covered by PEIs, and the pollutants reported in the NET inventory that are not reported in a PEI. Thresholds defining point sources of VOC and CO may also be defined differently in the two inventories. PEIs will report as point sources facilities emitting greater than 10 tons per year of VOC and 100 tons per year of CO. The NET inventory point source thresholds are variable, and

are defined by the data source used to compile a particular point source emission estimate. For instance, emission estimates for State A may have been drawn from a database of sources emitting over 1,000 tons per year. Emission estimates for State B may have come from that state's 1993 SIP inventory, where all sources emitting over 5 tons per year were inventoried as point sources. When states have inventoried the emissions for smaller emitting point sources, they should also report those emissions in the NET inventory.

To better understand, quality assure, and electronically store the estimates provided, both emissions and several supporting data elements are requested for each primary source grouping. The 1996 PEI submittal should contain complete (i.e., include emissions contributions from all sources) emission estimates for all of the major source groupings: point, area, onroad mobile, non-road mobile, and biogenic; however, the supporting data behind the estimates that are submitted can vary based on the data priorities and the available resources of the compiling agency. In simplest terms, basic estimate and supporting data reporting should be focused on the highest priority emitters.

Detailed reporting requirements for point, area, mobile, and biogenic source emissions will vary by source type, based on the data elements needed to calculate the emissions for a source and pollutant, the data needed to adjust the emission estimate to a seasonal or daily basis, and the data elements needed for air modeling purposes. A data element is a piece of information used to characterize some aspect of a source category's emissions, such as the pollutant, the plant street address, or operation hours per day. Tables 2-1 through 2-5 list the data elements required for each inventory source for both the PEI and the NET inventory. Appendix A contains a data glossary for the data elements listed in the tables.

2.3.1 Point Source Data Elements

Inventory reporting requirements for point sources are shown in Table 2-1 for PEI and NET purposes. Due to the larger number of emission points and their generally increased

**TABLE 2-1. DETAILED REPORTING REQUIREMENTS FOR POINT SOURCES
FOR PEI AND NET INVENTORIES**

| Data Elements* | Periodic Inventory Requirements | NET/State Inventory Requirements |
|-------------------------------------|---|---|
| Emission Levels | VOC ≥ 10 tpy NO _x ≥ 100 tpy CO ≥ 100 tpy | NA ^b |
| Pollutants Addressed | VOC, NO _x , CO | VOC, NO _x , CO, PM-10, PM-2.5, SO ₂ , HAPs ^c , Ammonia |
| Start Date (inventory year) | ✓ | ✓ |
| Start time (hour) | ✓ | ✓ |
| State FIPS | ✓ | ✓ |
| County FIPS | ✓ | ✓ |
| SIC code | ✓ | ✓ |
| Federal ID Code (plant) | ✓ | ✓ |
| Federal ID Code (point) | ✓ | ✓ |
| Process ID Code | ✓ | ✓ |
| Site Name | ✓ | ✓ |
| Physical address | ✓ | ✓ |
| SCC | ✓ | ✓ |
| Pollutant Code | ✓ | ✓ |
| Emission Factor | ✓ | ✓ |
| Heat content | ✓ | ✓ |
| Sulfur Content | ✓ | ✓ |
| Ash Content | ✓ | ✓ |
| Activity/Throughput (annual) | ✓ | ✓ |

**TABLE 2-1. DETAILED REPORTING REQUIREMENTS FOR POINT SOURCES
FOR PEI AND NET INVENTORIES (CONTINUED)**

| Data Elements^a | Periodic Inventory Requirements | NET/State Inventory Requirements |
|----------------------------------|--|---|
| Winter Throughput (%) | ✓ | ✓ |
| Spring Throughput (%) | ✓ | ✓ |
| Summer Throughput (%) | ✓ | ✓ |
| Fall Throughput (%) | ✓ | ✓ |
| Hr/day in operations | ✓ | ✓ |
| Day/wk in operations | ✓ | ✓ |
| Wk/yr in operations | ✓ | ✓ |
| Boiler Design Capacity | ✓ | ✓ |
| Maximum Design Rate | ✓ | ✓ |
| Maximum Nameplate Capacity | ✓ | ✓ |
| Primary Control Efficiency | ✓ | ✓ |
| Secondary Control Efficiency | ✓ | ✓ |
| Control Device Type | ✓ | ✓ |
| Rule Effectiveness % | ✓ | ✓ |
| Annual Emissions | ✓ | ✓ |
| Work Weekday Emissions | ✓ | ✓ |
| Federal ID Code (Stack Number) | ✓ | ✓ |
| X coordinate (latitude) | ✓ | ✓ |
| Y coordinate (longitude) | ✓ | ✓ |
| Stack Height | ✓ | ✓ |
| Stack Diameter | ✓ | ✓ |

**TABLE 2-1. DETAILED REPORTING REQUIREMENTS FOR POINT SOURCES
FOR PEI AND NET INVENTORIES (CONTINUED)**

| Data Elements^a | Periodic Inventory Requirements | NET/State Inventory Requirements |
|----------------------------------|--|---|
| Exit Gas Flow Rate | ✓ | ✓ |
| Exit Gas Velocity | ✓ | ✓ |
| Exit Gas Temperature | ✓ | ✓ |

^a All data element terms are defined in Appendix A.

^b Thresholds for all pollutants may vary from state to state in the NET inventory. See the discussion in Section 1.2.

^c HAPs includes 37 pollutants EPA is focusing on in its National Toxics Inventory. The 37 are toluene, POM, benzene, formaldehyde, xylenes, 1,3- butadiene, tetrachloroethylene, trichloroethylene, acetaldehyde, acrolein, methylene chloride, hydrazine, glycol ethers, styrene, arsenic compounds, chloroform, nickel compounds, lead compounds, manganese compounds, ethylene dichloride, bis(2-chloroethyl) ether, cadmium compounds, acrylonitrile, ethylene oxide, vinyl chloride, chromium compounds, diphenyl methane diisocyanate, mercury compounds, 2,4-toluene diisocyanate, antimony compounds, ethylene dibromide, acrylamide, beryllium compounds, phosgene, 2,3,7,8-TCDD, 2,3,7,8-TCDF, and coke oven emissions. In terms of POM data, states need to clearly identify how they define POM and what species are included in the POM estimate.

complexity, more information is requested for point sources than any of the other source types. The data reporting request centers around providing information to identify the physical source (name, location, identification codes, etc.), data to describe the individual emission points and their operation (SCC, pollutants emitted, stack identification, activity data, schedules), emission estimates (annual, and average seasonal), and information required for modeling. The requirements specified in Table 2-1 are consistent with the structure of the EIIP Data Model. The EPA recognizes that not all supporting data elements can be reported, due to confidentiality laws in a state. Information on some other data elements, such as boiler design capacity, or the heat sulfur or ash content of fuel, may not be applicable, and some data elements may not be available.

An important distinction between the PEI and NET inventory point source information is the potential difference in the emission thresholds defining point sources. It is quite possible that states may have point source data for sources that are not reported as point sources in the NET inventory. These sources should be added to the NET inventory as point sources. When a process included in a point source category also takes place as an area source category, double counting may occur. States should check, and if necessary, update emissions for those area sources when adding point source records.

2.3.2 Area Source Data Elements

Table 2-2 lists the reporting requirements for area source categories for PEI and NET purposes. Similar to point sources, these reports should present data that identifies and describes the source category and its location (e.g., category name, county code), emission factors, the activity and operational schedule of the category (e.g., total annual activity, daily/weekly/seasonal operating schedules), and the applicability of controls. Emission estimates are needed on an annual and average seasonal daily basis. Information on controls and their associated rule effectiveness and rule penetration factors is needed if these factors were applied to determine the area source estimate.

**TABLE 2-2. DETAILED REPORTING REQUIREMENTS FOR AREA SOURCES FOR
PEI AND NET INVENTORIES**

| Data Elements ^a | Periodic Inventory Requirements | NET/State Inventory Requirements |
|------------------------------|---|---|
| Emission Levels | VOC ≤ 10 tpy NO _x ≤ 100 tpy CO ≤ 100 tpy | NA ^b |
| Pollutants Addressed | VOC, NO _x , CO | VOC, NO _x , CO, PM-10, PM-2.5, SO ₂ , HAPs ^c , Ammonia |
| Start Date (inventory year) | ✓ | ✓ |
| State FIPS | ✓ | ✓ |
| County FIPS | ✓ | ✓ |
| Source Category Code | ✓ | ✓ |
| Pollutant Code | ✓ | ✓ |
| Emission Factor | ✓ | ✓ |
| Activity/Throughput (annual) | ✓ | ✓ |
| Winter Throughput (%) | ✓ | ✓ |
| Spring Throughput (%) | ✓ | ✓ |
| Summer Throughput (%) | ✓ | ✓ |
| Fall Throughput (%) | ✓ | ✓ |
| Hr/day in operations | ✓ | ✓ |
| Day/wk in operations | ✓ | ✓ |
| Wk/yr in operations | ✓ | ✓ |
| Control Efficiency (%) | ✓ ^d | ✓ |
| Rule Effectiveness (%) | ✓ ^d | ✓ |
| Rule Penetration (%) | ✓ ^d | ✓ |
| Annual Emissions | ✓ | ✓ |

TABLE 2-2. DETAILED REPORTING REQUIREMENTS FOR AREA SOURCES FOR PEI AND NET INVENTORIES (CONTINUED)

| Data Elements ^a | Periodic Inventory Requirements | NET/State Inventory Requirements |
|--------------------------------------|---------------------------------|----------------------------------|
| Summer/winter work weekday emissions | ✓ | ✓ |

^a All data element terms are defined in Appendix A.

^b Thresholds for all pollutants may vary from state to state in the NET inventory. See the discussion in Section 1.2.

^c HAPs includes 37 pollutants EPA is focusing on in its National Toxics Inventory. The 37 are toluene, POM, benzene, formaldehyde, xylenes, 1,3- butadiene, tetrachloroethylene, trichloroethylene, acetaldehyde, acrolein, methylene chloride, hydrazine, glycol ethers, styrene, arsenic compounds, chloroform, nickel compounds, lead compounds, manganese compounds, ethylene dichloride, bis(2-chloroethyl) ether, cadmium compounds, acrylonitrile, ethylene oxide, vinyl chloride, chromium compounds, diphenyl methane diisocyanate, mercury compounds, 2,4-toluene diisocyanate, antimony compounds, ethylene dibromide, acrylamide, beryllium compounds, phosgene, 2,3,7,8-TCDD, 2,3,7,8-TCDF, and coke oven emissions. In terms of POM data, states need to clearly identify how they define POM and what species are included in the POM estimate.

^d Control and rule percentages need to be entered when they are used to calculate emissions for a source category.

Area source emissions for the NET inventory have been compiled from several sources. In some cases, point sources in the PEI may account for some of the area source emissions currently in the NET inventory. States need to be cognizant of how a source's or source category's emissions are being accounted for between the two inventories so that neither double counting nor under reporting occurs.

2.3.3 Onroad Mobile Source Data Elements

Table 2-3 lists reporting requirements for onroad mobile sources. Unlike point or area sources, only summer/winter work weekday emissions (average seasonal day) may need to be reported, depending on the inventory type. Onroad mobile emissions are calculated using the MOBILE model (or other state model such as California's EMFAC model), and the resulting emission factors are typically applied to daily VMT estimates to obtain a daily emissions estimate. If the state chooses to provide to the NET inventory emissions information for this source type developed for the PEI, then an estimate of annual emissions should be provided. States should discuss their PEI reporting needs for onroad mobile annual and seasonal emissions with their RO.

The data element Source Category may be one of several ways of grouping onroad mobile activity. Typically, the source category is defined by a combination of vehicle type, roadway type, and vehicle speed for which vehicle miles traveled (VMT) are collected and emission factors are calculated. Source categories by vehicle type are listed at the end of Table 2-3 and in Appendix A.

VMT in the NET are based on VMT data taken from the Federal Highway Administration's (FHWA) Highway Performance Monitoring System (HPMS). The VMT data in HPMS is submitted to FHWA by each State's Department of Transportation. You are welcome to review and provide comments on these VMT estimates. However, if you suggest changes to VMT estimates that would make them different from the VMT estimates

TABLE 2-3. DETAILED REPORTING REQUIREMENTS FOR ONROAD MOBILE SOURCES FOR PEI AND NET INVENTORIES TABLE

| Data Elements ^a | Periodic Inventory Requirements | NET/State Inventory Requirements |
|--------------------------------------|---------------------------------|---|
| Pollutants Addressed | VOC, NO _x , CO | VOC, NO _x , CO, PM-10, PM-2.5, SO ₂ , HAPs ^b , Ammonia |
| Start Date (inventory year) | ✓ | ✓ |
| State FIPS Code | ✓ | ✓ |
| County FIPS Code | ✓ | ✓ |
| Source Category Code | ✓ | ✓ |
| Pollutant Code | ✓ | ✓ |
| Emission Factor | ✓ | ✓ |
| Activity (VMT by Roadway Class) | ✓ ^c | ✓ |
| Annual Emissions | ✓ | ✓ |
| Summer/winter work weekday emissions | ✓ | ✓ |

^a All data element terms are defined in Appendix A.

^b HAPs includes 37 pollutants EPA is focusing on in its National Toxics Inventory. The 37 are toluene, POM, benzene, formaldehyde, xylenes, 1,3- butadiene, tetrachloroethylene, trichloroethylene, acetaldehyde, acrolein, methylene chloride, hydrazine, glycol ethers, styrene, arsenic compounds, chloroform, nickel compounds, lead compounds, manganese compounds, ethylene dichloride, bis(2-chloroethyl) ether, cadmium compounds, acrylonitrile, ethylene oxide, vinyl chloride, chromium compounds, diphenyl methane diisocyanate, mercury compounds, 2,4-toluene diisocyanate, antimony compounds, ethylene dibromide, acrylamide, beryllium compounds, phosgene, 2,3,7,8-TCDD, 2,3,7,8-TCDF, and coke oven emissions. In terms of POM data, states need to clearly identify how they define POM and what species are included in the POM estimate.

^c Vehicle types that are used as source categories for onroad mobile sources are:

- a. Light Duty Gasoline Vehicles
- b. Light Duty Gasoline Trucks I
- c. Light Duty Gasoline Trucks II
- d. Light Duty Diesel Vehicles
- e. Light Duty Diesel Trucks
- f. Heavy Duty Gasoline Vehicles
- g. Heavy Duty Diesel Vehicles
- h. Motorcycles
- i. Vehicle Refueling

in HPMS, you will be asked to provide documentation explaining why these VMT estimates are different from those submitted to FHWA by your State's Department of Transportation for use in HPMS.

Please note that the data requested here is data sufficient for regional scale air modeling. There may be more data needed for modeling by a state's RAMP (see Section 1.4). As an example, mobile model inputs may be requested by RAMPs, but the data used to run the MOBILE model have not been requested. States should document and maintain records on the information and files used to run the MOBILE model, should they be requested to resolve future questions.

Vehicle refueling emissions can also be generated as an onroad mobile source through the MOBILE model; however, EPA prefers that these emissions be reported as an area source category of gasoline distribution-stage II.

2.3.4 Non-road Mobile Source Data Elements

The reporting requirements for non-road mobile source emissions are found in Table 2-4. These requirements are focused on describing non-road estimates and do not request an extensive amount of background information that may have been necessary to support the estimates (e.g., data manipulations that may have been necessary to develop final landing/takeoff activity for aircraft). Typically for non-road sources, a significant amount of information may have to be developed for the activity used to calculate emissions. The reporting requirements shown in Table 2-4 do not mandate that these background data be provided as part of the PEI or NET inventory process. However, as discussed in Chapter 4, states should keep a record of these data in their files, so that they can be used to resolve any future questions that may arise. The regional office may ask for more detailed information than what is defined here.

TABLE 2-4. DETAILED REPORTING REQUIREMENTS FOR NON-ROAD MOBILE SOURCES FOR PEI AND NET INVENTORIES

| Data Elements^a | Periodic Inventory Requirements | NET/State Inventory Requirements |
|--|--|---|
| Pollutants Addressed | VOC, NO _x , CO | VOC, NO _x , CO, PM-10, PM-2.5, SO ₂ , HAPs ^b , Ammonia |
| Start date (inventory year) | ✓ | ✓ |
| State FIPS Code | ✓ | ✓ |
| County FIPS Code | ✓ | ✓ |
| Source Category Code (Equipment Type)^c | ✓ | ✓ |
| Pollutant Code | ✓ | ✓ |
| Annual Activity | ✓ | ✓ |
| Annual Emissions | ✓ | ✓ |
| Summer/winter work weekday emissions | ✓ | ✓ |

^a All data element terms are defined in Appendix A.

^b HAPs includes 37 pollutants EPA is focusing on in its National Toxics Inventory. The 37 are toluene, POM, benzene, formaldehyde, xylenes, 1,3- butadiene, tetrachloroethylene, trichloroethylene, acetaldehyde, acrolein, methylene chloride, hydrazine, glycol ethers, styrene, arsenic compounds, chloroform, nickel compounds, lead compounds, manganese compounds, ethylene dichloride, bis(2-chloroethyl) ether, cadmium compounds, acrylonitrile, ethylene oxide, vinyl chloride, chromium compounds, diphenyl methane diisocyanate, mercury compounds, 2,4-toluene diisocyanate, antimony compounds, ethylene dibromide, acrylamide, beryllium compounds, phosgene, 2,3,7,8-TCDD, 2,3,7,8-TCDF, and coke oven emissions. In terms of POM data, states need to clearly identify how they define POM and what species are included in the POM estimate.

^c Equipment types that are used as source categories for non-road mobile sources are:

- a Aircraft
- b Locomotives
- c Commercial Marine Vessels
- d Other Equipment and Engine Types
 - Lawn and Garden Equipment
 - Construction Vehicles
 - Agricultural Vehicles
 - Industrial Equipment
 - Airport Service Equipment
 - Recreational Equipment
 - Logging Equipment
 - Recreational Marine Equipment
 - Light Commercial Equipment

The data requests for non-road mobile sources primarily focus on defining the source categories inventoried and their location, the activity parameters for the category, and on providing emissions estimates on an annual and average season daily basis. The individual non-road source categories that are inventoried and reported are expected to be consistent with those defined by EPA/OMS as the chief non-road emission categories. A list of the client non-road categories is provided at the end of Table 2-4 and in Appendix A; although, a state can certainly report additional non-road category emissions if they have them. It is possible that a state would not need to include all of the OMS non-road source categories and thus would not have to report anything for those (e.g., commercial marine vessels in landlocked states, snowmobiles in Florida, etc.). Even though perhaps obvious, these exemptions should be noted in the state's inventory documentation.

2.3.5 Biogenic and Geogenic Source Data Elements

Table 2-5 lists reporting requirements for PEI biogenic and NET inventory geogenic sources. Biogenic sources are forests, agricultural crops and agricultural soils, emitting VOC and NO_x . The geogenic source covered in the NET inventory is wind erosion of agricultural land as a source of PM-10 and PM-2.5.¹

Biogenic sources are not included as part of the NET inventory. The EPA will provide emission estimates for biogenic sources in the Fall of 1997 to the states through the Internet on the NET Web page. Biogenic sources are part of the required data submission for the PEI. States may decide to use the EPA's biogenic emission estimates for their PEI submission.

Models such as the Biogenic Emissions Estimation System (BEIS), are typically used to estimate emissions for biogenic sources. The BEIS estimates emissions for a single modeled day. The parameters recommended for the model run are chosen to represent a typical high, but not peak, ozone day in the summer. For the PEI, only the results for the modeled day are

TABLE 2-5. DETAILED REPORTING REQUIREMENTS FOR BIOGENIC AND GEOGENIC SOURCES FOR PEI AND NET INVENTORIES

| Data Elements^a | Periodic Inventory Requirements | NET/State Inventory Requirements |
|--|--|---|
| Pollutants Addressed | VOC, NO _x | PM-10 |
| Source Type | Biogenic | Geogenic |
| Start date (inventory year) | ✓ | ✓ |
| State FIPS Code | ✓ | ✓ |
| County FIPS Code | ✓ | ✓ |
| Source Category Code | ✓ | ✓ |
| Pollutant Code | ✓ | ✓ |
| Annual Emissions | | ✓ |
| Summer/winter work weekday emissions (modeled day emissions) | ✓ ^b | ✓ |

^a All data elements are defined in Appendix A.

^b Modeled day emissions are required for biogenic sources. These emission estimates are generated by the Biogenic Emissions Estimation System (BEIS), which will typically be used for estimating emissions from this source.

required. Geogenic sources are not required for the PEI, but are included in the NET inventory. Emissions are provided for an average day and as an annual number.

2.4 SUMMARY DATA REPORTING

General summaries of the 1996 PEI data should be compiled in addition to the detailed source data specified in Section 2.3. These summaries will be used to communicate answers to the most frequently asked questions about an emissions inventory: how much, from where, and of what type. This summary allows for a rapid, top-down evaluation of the inventory, and when presented in a standardized style, will allow for easy and efficient comparison with other state's inventories.

The reporting requirements presented in this guidance document should be viewed as minimum requirements and EPA encourages state and local agencies to go beyond these requirements should they chose. The minimum requirements are summarized below, and after each summary a short example table is shown further illustrating the data requested.

- Total emissions by pollutant (VOC, NO_x, and CO) for ozone nonattainment areas and CO for CO nonattainment areas, emissions should be expressed for the entire designated nonattainment areas on both an annual and seasonal daily basis:

Example Table

| Pollutant | Seasonal Daily Emissions, tons/day | Annual Emissions, tons/year |
|-----------------|------------------------------------|-----------------------------|
| VOC | | |
| NO _x | | |
| CO | | |

- Emissions by county and by pollutant for the total nonattainment area should be provided on both an annual and seasonal basis:

Example Table

| County Name | VOC Emissions | | CO Emissions | | NO _x Emissions | |
|----------------------|---------------|---------|--------------|---------|---------------------------|---------|
| | tons/yr | lbs/day | tons/yr | lbs/day | tons/yr | lbs/day |
| County 1 | | | | | | |
| County 2 | | | | | | |
| County 3 | | | | | | |
| etc..... | | | | | | |
| Nonattainment | | | | | | |

- Total emissions by pollutant for each major source grouping in the inventory on a total nonattainment area basis, provide data on both an annual and seasonal daily basis:

Example Table

| Source Type | VOC Emissions | | CO Emissions | | NO _x Emissions | |
|------------------------|---------------|---------|--------------|---------|---------------------------|---------|
| | tons/yr | lbs/day | tons/yr | lbs/day | tons/yr | lbs/day |
| Point Sources | | | | | | |
| Area Sources | | | | | | |
| On-road Mobile Sources | | | | | | |
| Nonroad Mobile Sources | | | | | | |
| Biogenic Sources | | | | | | |
| TOTAL EMISSIONS | | | | | | |

- Total emissions by pollutant by major source grouping with each county or sub-county area of the nonattainment area, data need to be presented on an annual and seasonal daily basis, probably will need one table per pollutant:

Example Table - VOC Emissions

| County | Point Source | | Area Source | | On-road Mobile | | Nonroad Mobile | | Biogenic | |
|----------|---------------|-------------|---------------|-------------|----------------|-------------|----------------|-------------|---------------|-------------|
| | tons/ year | lbs/ day | tons/ year | lbs/ day | tons/ year | lbs/ day | tons/ year | lbs/ day | tons/ year | lbs/ day |
| County 1 | | | | | | | | | | |
| County 2 | | | | | | | | | | |
| County 3 | | | | | | | | | | |
| etc..... | | | | | | | | | | |
| TOTAL | | | | | | | | | | |

3.0 ELECTRONIC DATA REPORTING REQUIREMENTS

3.1 OVERVIEW

In addition to the paper copy reporting that was described in the previous chapter, electronic reporting is also required. Paper copy reporting of inventory data for the PEI or for changes to the NET inventory data must be accompanied by electronic reporting of the same data. This guidance will deal in more general concepts of electronic reporting. This guidance document will not prescribe specific data entry methods or a specific electronic file format, but it will list five basic options from which the state can choose to electronically submit their data.

Five basic options for electronic data reporting exist:

- Emission Inventory Improvement Program (EIIP)/ Electronic Data Interchange (EDI) format;
- EPA NET Database format;
- NET Text File Overwrite Format;
- Aerometric Information Retrieval System (AIRS) AFS (Facility Subsystem) format; and
- State-specific format.

In this chapter, each of the five basic reporting options will be described, and the steps necessary to transfer data from a state's data system to the EPA will be reviewed.

Electronic reporting of inventory data is an issue that is dynamic and changing. States should use resources such as the EIIP Data Management portion of the CHIEF BBS on the

EPA TTN or the EIIP Data Management Web page on the EIIP Internet World Wide Web site to keep abreast of the latest developments and direction.^a

States need to fully understand that all emissions inventory data that are submitted to EPA electronically (or otherwise) will be made publicly available as part of the national inventory (NET). Data could be placed on an FTP site and made accessible through the Internet, placed on EPA electronic bulletin boards, or published in printed reports. States should, therefore, not submit any confidential information to EPA as a part of this process because EPA will not have any provisions for dealing with this information and treating it differently as confidential data. Any PEI provided by states is subject to full public disclosure.

3.2 ELECTRONIC REPORTING OPTIONS

The inventory data reported electronically will be stored and used by the EPA and by other states for air modeling, tracking progress in meeting CAA requirements, setting policy and answering questions from the public. The EPA is taking on the responsibility of creating and maintaining the newly-designed central repository of inventory data for all states, but the data in the central repository must be supplied by the states in electronic form. In order to facilitate the transfer of the state-generated inventory data, the EPA has supported the development of a standard for data transfer through the EIIP. The following discussions will give an overview of the EIIP data transfer developments and five basic options for electronic data reporting of inventory data.

The EIIP has been set up as a collaboration between states, industry, academia and the EPA to improve inventory methods and reporting. EIIP products that can be used to prepare inventories are discussed in Chapter 5 of this document. One goal of the EIIP has been to

^a The OAQPS TTN/CHIEF can be accessed by modem by calling (919) 541-5742, or through the Internet at: <http://tnwww.rtpc.epa.gov/>.

develop a standard data transfer format. An EIIP Data Model has been developed to identify the pertinent emission inventory data elements that are needed for regional air quality modeling, and to standardize the data definitions and their relationships. The EIIP/EDI format, and the EPA NET Database are being developed using the EIIP data model. When state and local agencies consider using these options, they should compare their inventories and the EIIP data model to ensure that the significant data elements and data relationships necessary for emission inventory storage and transfer have been included.

The EIIP Data Model is described in EIIP Volume VII, Chapter 1, EIIP Phase 1 Data Model.³ Additional documentation and background about the EIIP Data Model is available on the EIIP portion of the CHIEF BBS on the OAQPS TTN and the EIIP Web page, and final data model documentation is expected to be available on the BBS and Web page in Summer 1997. Readers are urged to stay current on the status and structure of the model by consulting the latest documents posted on either the BBS or Web page.

3.2.1 EIIP/ EDI Format

The EIIP is developing a data transfer format using existing Electronic Data Interchange (EDI) standards. The EDI data exchange standard is a nonproprietary standard created and maintained by the American National Standards Institute (ANSI). The EIIP/EDI format can provide a common data exchange format for federal, state and local government agencies, and eventually for industry, to exchange emissions inventory information electronically using a single data transfer format. This data transfer format can be used as a bridge between all trading partners because as an external standard format, it does not require or impose the rules of one unique or shared database.

The EIIP/ EDI format has been developed in draft and is being tested in a prototype data transfer demonstration with two pilot states and EPA. The prototype demonstration is expected to continue through Winter 1997. Any state/ local agency is welcome to become a

pilot participant. Because the prototype is in a developmental phase, participants that pursue this option will receive technical and administrative support from the EIIP. Interested pilot participants should contact the EPA's Emission Factor and Inventory Group (EFIG).

The technical documentation which is necessary for the EDI data transfer prototype demonstration may be found on the EIIP portion of the CHIEF BBS on the OAQPS TTN and the EIIP Web page. Two documents may be especially useful to understand the EDI development and the data transfer demonstration that is underway. They are: Summary of the Data Management Committee Workplans and Technical Steps for Developing the EDI Format; and the Prototype Demonstration for Data Transfer Method with Approach Study (final action plan). The first document describes how the current draft EDI format was developed and the second document provides an example of how EDI data transfer is done and the steps that the trading partners will take to accomplish data transfer using the EIIP/EDI standard format. Figure 3-1 illustrates the complete data transfer process, with the state and local agencies' and receiving agencies' responsibilities in overlapping blocks.

The steps that a state will follow in the prototype data transfer system using the EIIP/EDI data transfer format are:

- 1) Identify a commercially available EDI translator that is compatible with the data application and local computing system environment. (The current participants are using the same EDI translator, provided as part of the EIIP prototype system.)
- 2) Program the translator using the EIIP/EDI technical documents. (The programming of the shared EDI translator is provided as part of the EIIP prototype system.)
- 3) Define the loader file format for the translator. (The loader file format for the shared translator is provided as part of the EIIP prototype system.)
- 4) Program a conversion utility to extract and map the state data into the appropriate fields of the loader file format

The diagram illustrates the EIP (X12) Data Exchange Process, showing the flow of data between two systems: the State/Local Agency EIP Data System and the Receiving Agency (State/Local/EPA) EIP Data System.

State/Local Agency EIP Data System:

- State/Local EIP Data Base:** The source of the data.
- Extracted EIP Data File:** Data is extracted from the base into this file.
- EDI X12 Translator:** The extracted data file is processed by this translator.

Receiving Agency (State/Local/EPA) EIP Data System:

- EIP (X12) Formatted File:** Receives data from the State/Local Agency's EDI X12 Translator.
- EDI X12 Translator:** This translator also receives data from the State/Local Agency's EDI X12 Translator, indicating a bidirectional or shared processing step.
- Flat File:** Data from the EIP (X12) Formatted File is converted into a flat file format.
- State/Local or EPA EIP Data Base:** The flat file is loaded into the receiving agency's data base.

Data Flow:

- From **State/Local EIP Data Base** to **Extracted EIP Data File**.
- From **Extracted EIP Data File** to **EDI X12 Translator**.
- From **EDI X12 Translator** to **EIP (X12) Formatted File**.
- From **EIP (X12) Formatted File** to **EDI X12 Translator** (bidirectional flow).
- From **EDI X12 Translator** to **Flat File**.
- From **Flat File** to **State/Local or EPA EIP Data Base**.

FINAL

- 5) Convert the extract file of state data to an EDI formatted file, using the EDI translator.
- 6) Transfer the EIIP/EDI standard format file to EPA.

Inventory data that has been converted to the EIIP/EDI format can be made available to the EPA or any other requestor by sending it on a floppy disk, electronically through Internet E-mail, or by providing a downloadable file on an Internet FTP site. The EIIP/EDI prototype demonstration intends to test data transfer via the Internet.

3.2.2 EPA NET Database Format

Another data transfer option is to use the EPA NET Database Format. This new database is being designed by EPA to accept state inventory data and store those data as part of the NET inventory. The NET database will be compatible with the EIIP data model, and include the data elements and data relationships as they are defined in the EIIP data model. The NET database will also be used in the EIIP EDI data transfer prototype data transfer demonstration described above.

Documentation for an input data transfer format to the NET database is expected to be distributed by EFIG in Fall 1997. Distribution will be by mail, and also through the CHIEF BBS and Internet World Wide Web site.

The basic steps for data transfer using the EPA NET database format are described as follows:

- 1) Map state inventory data to the EPA NET database format.
- 2) Program a conversion utility to translate data in the state's database to EPA NET database input format files, using the mapping scheme developed in Step 1. Software needed for the translation could be any database or spreadsheet program or other data handling system capable of generating files compatible with the NET file structure.

Information about AIRS can be found on the OAQPS TTN/AIRS BBS, or through the OAQPS TTN Web page, described earlier in this chapter.

3.2.5 Other Electronic Reporting Formats

Other reporting formats for inventory data are electronic files in a state-specific format, and may be either database, spreadsheet or flat ASCII files. This is the least favorable alternative for electronic data submission to the EPA database. If data are provided in this form, EPA will not make a commitment to enter that data into the central national database.

If a state intends to submit data in this form, the RO and EFIG should be contacted. Either the RO or EFIG should be able to define the best possible form for the data.

If data are not entered into the national database, either because it was not submitted electronically, or the EPA could not convert the data from the electronic format that it was submitted in, then the EPA and other states will use the data generated for the NET inventory for modeling and other air quality studies.

Some states' data storage systems may be able to be programmed to output stored data in the correct format.

- 3) Use the software developed in Step 2 to translate state's data into EPA NET database files.
- 4) Transfer the EPA NET database files to the EPA.

3.2.3 NET Text File Overwrite Format

The initial NET inventory files will be distributed by the EPA in Summer 1997 as both text and database files. Some state or local agencies may choose to update the NET data by overwriting the NET distribution file. Although this approach has the benefit of simplicity, the potential for transcription errors is high. If significant changes are planned to replace the NET data, this option is not recommended.

3.2.4 AIRS Format

The AIRS format has been used for electronic reporting for previous inventories and is still the primary inventory data storage vehicle for several states. Although using the AIRS format is a feasible and valid way to make an electronic inventory submittal, this method of reporting has some limitations. The chief constraint is that only point source information can be submitted in the AIRS format. Other portions of the AIRS system, such as the Area and Mobile Source (AMS) system are no longer being maintained. Consequently, this option may be less preferable to reporting in either the EIIP/EDI or EPA NET database transfer formats.

In order to accommodate 1996 PEI point source data submittals in the AIRS/AFS format, the EPA will translate AFS-formatted data into a compatible format for storage in the EPA repository database (most likely using the new EPA NET format). For States that submit point source data via AIRS/AFS, it will be necessary to use one of the other data transfer options discussed in this chapter, to submit area, mobile and biogenics data.

4.0 DOCUMENTATION AND DATA REVIEW

4.1 DOCUMENTATION CONSIDERATIONS

Like any inventory reporting process of this magnitude, the 1996 PEI and NET inventory submittals will need to contain a sufficient level of documentation to identify for the reviewer's benefit how and from where the emissions estimates were derived. For the 1996 PEI submittals, EPA does not want to make documentation a major hurdle, but at the same time it needs to ensure that the explanations provided are adequate to answer basic inventory review questions. The level of detailed documentation that will be required of any given inventory will likely follow the same theme that has been proposed in other recent EPA guidance on the 1996 PEIs.² That theme is that the necessary level of detailed documentation a state or local agency must prepare and provide will be a negotiated position between the State and the EPA Regional Office (RO) based on the RO's unique knowledge and understanding of its states' inventories. It is not EPA's position or desire to impose some kind of uniform, "one size fits all" set of documentation criteria on the 1996 PEI and NET inventory submittals. Instead, the individual ROs can work directly with each of their respective state or local agencies to determine what they (the RO) think is necessary in terms of sufficient documentation. This approach will help the state focus on what is important and will save the RO from having to review information that is not essential or necessary for inventory approval.

However, for the purposes of the 1996 PEIs and NET inventory data (that may be provided), states will need to provide a minimum level of documentation to EPA as a part of the inventory reporting process, regardless of the specific and possibly more detailed documentation requirements states may negotiate with their respective EPA RO. This type of preliminary documentation will be crucial in helping EPA understand the context of various inventory submittals and how they should be evaluated. The minimum level of documentation should describe in broad general terms how the inventory data were collected and their source.

In most cases, documentation for a source category may be no more than a sentence describing the general method of emissions calculation and how the variables in the calculation were obtained. For example:

- 1) Architectural coatings used the EIIP preferred method and U.S. Census Bureau population data.
- 2) Plant B's HAP emissions have been compiled as part of this state's Title V permitting program.
- 3) County C's area source inventory's VOC emissions were grown from 1993 using BEA factors except for area source graphic arts, which was compiled through a survey of a subset of facilities. The graphic arts survey was conducted in 1995 and data were obtained from 70 percent of the sources. Results for the other 30 percent were extrapolated from the survey data.

Examples of data sources would be source surveys, existing state databases, products of annual state reporting requirements, state agency regional office files, permitting files, the projection of a past inventory, AP-42 factors, the MOBILE model, etc. A description of this type should be provided for all major source groupings (point, area, onroad mobile, etc.). The degree of subcategorization within the major groupings will be up to the state and be a function of how specific source categories were addressed. In addition, if different state agency offices or districts were responsible for developing parts of the inventory, and they used differing approaches, this information should be summarized by office or district.

States should understand that while EPA is striving to provide flexibility, eliminate redundant activities, and reduce the cost of complying with inventory reporting provisions, a fundamental amount of explanatory information needs to accompany every inventory submittal. This basic information is needed to explain, from an overview perspective, the sources of the data, how were they compiled, who compiled them, what estimation methods and tools were used, and are there any aspects that are unique or special that EPA should

understand about an inventory. These kinds of information can be described in narrative form, and in combination with simple tabular presentations.

Detailed documentation for the specific method of calculation for each source category and facility within a category does not have to be submitted with the inventory (unless requested by the RO); however, the data should be maintained and available from the state files if the EPA desires to investigate and understand the derivation of an estimate in greater detail. The data retained by the state should be sufficient to allow an independent reviewer to replicate the state's emission estimates on site. It is also important that the informational references for the method's input data be complete and specific. For example, the state records should indicate the specific location within AP-42 that an emission factor came from, not just that it came from AP-42.

The bulk of the detailed data that would be a part of complete documentation could, in most cases, be made available or directly submitted as a part of the inventory electronic data files EPA wants to obtain for the 1996 PEIs and NET inventory. The electronic reporting requirements are specified in Chapter 2, and represent a very detailed level of information that clearly will help document an inventory. Electronic files from state databases (primarily for point sources), spreadsheets (primarily area sources), and models (e.g., MOBILE, BEIS, etc.) used to produce the inventory will contain the bulk of all documentation needed to replicate any estimate. State and local agencies are not being asked to reproduce or summarize this detailed information for the sake of a paper copy inventory documentation report.

4.2 DATA REVIEW

Early in the inventory process, state agencies should contact their EPA regional office to define completeness, submission requirements and QA issues for their inventory. Regions may need to develop their own documentation standards.

Once compiled, the state and local agencies will submit the PEIs to their respective EPA Regional Offices for review and evaluation. Each Regional Office will be responsible for working with each individual PEI-submitting agency to determine how the data will be reviewed and what kinds of, if any, additional, more detailed documentation will be required. The goal of this approach is to better fit the review process to the specific inventory needs of each state, instead of having a "one size fits all" approach to the review and approval process. This approach is expected to make inventory review more focused, effective, and timely. The goal is to be able to address specific needs and concerns of each state and its inventories, while at the same time ensuring that a general level of review consistency is maintained across the entire country.

States should also send electronic data files of the PEI directly to EPA/EFIG in parallel with sending them to the ROs for both initial submissions and any updated data. Also, states should send any other electronic data files of information for updating the NET inventory data to EPA/EFIG. EPA/EFIG will use both types of data files for NET inventory updating and quality assurance purposes.

EPA/EFIG and EPA/OMS will provide oversight and guidance to the ROs on the technical review of electronically submitted PEI data. In this capacity, the ROs may provide questions to EPA/EFIG and EPA/OMS on electronic information. EPA/EFIG and EPA/OMS will provide limited and specific review support and return comments as necessary to the RO. The RO will review and consolidate all EPA comments into one set of comments that addresses both the paper copy and electronically-submitted materials. These comments will then be forwarded to the state or local agency so that the inventory can be revised.

The state or local agency can then revise the PEI submittal and provide it to the EPA RO in final form so that the approval process can begin if required. The RO then has the responsibility to conduct all final review and formally approve the 1996 PEI for the area. The inventory data that are in electronic format will be loaded into the EPA database.

5.0 PROCEDURAL GUIDANCE AND THE ROLE OF THE EMISSION INVENTORY IMPROVEMENT PROGRAM (EIIP)

Previous chapters in this guidance document have specified reporting requirements for the PEI and NET data. These discussions have not included any guidance on the procedural aspects of creating the emission inventory estimates. Instead of preparing and publishing new procedural inventory guidance for the 1996 PEIs, EPA intends to rely on existing guidance and the guidance materials being published by the Emission Inventory Improvement Program (EIIP) to address procedural needs. The purpose of this chapter is to summarize the procedural guidance resources available to states through the EIIP.

The EIIP is a cooperative effort between state and local agencies, industry, academia and the EPA to improve air inventory methods and reporting. The EIIP process has been put in place with the goals of helping state and local agencies develop higher quality inventory data, reduce the costs of inventory development and to improve communications and understanding among all inventory groups. The project has been supported by state and local agencies with 105 grant funds, and the various EIIP committees are composed of state and local agency personnel, industry representatives and EPA staff. Review and feedback on EIIP products is welcomed from anyone in the inventory community.

The EIIP has established committees to address emission inventory issues pertaining to point, area, mobile, and biogenic sources, data management, quality assurance and interactions between government agencies. The committees for point, area, and mobile source types are all in the process of producing documents with specific procedural guidance on estimating emissions for source categories within their source type. A subcommittee has also been formed to examine the use of rule effectiveness in inventories. Point and Area Source Committees have produced multiple chapters that each address the preferred and alternative methods available for estimating emissions from a source category. The Biogenic Sources Committee has a completed document on estimating emissions from four natural sources. The

responsibilities have been focused on developing a data model to be used for data reporting (see Section 3.2). The Quality Assurance Committee is also working on the issue of bringing quality assurance and quality control into all aspects of an emission inventory. Work includes a volume of procedures for inventory quality assurance, software for evaluating the quality of emission estimates, and training.

EIIP guidance documents can be found on the EIIP Web site at:
<http://134.67.104.12/html/chief/chief.htm#CH14> , or through the general EPA TTN Web site at
<http://ttnwww.rtpnc.epa.gov/> .

The following sections briefly summarize each EIIP committee's goals and accomplishments. Individual documents and their completion status as of June 1997 are also listed for each committee.

5.1 POINT SOURCES

The Point Sources Committee has a mandate to address the needs for updated and improved point source emissions estimation guidance. This guidance seeks to improve point source emissions completeness, accuracy, consistency, quality assurance, and data organization. Source categories are selected for treatment by the committee based on the significance of emissions nationally or regionally, the number of individual sources in the category, the involvement of the category in a significant regulatory initiative, and the level of uncertainties surrounding the methods currently available for emissions estimation. The committee works through a team of EPA, state and local agency, industry, and consultant personnel, and has been instrumental in encouraging industry participation in the EIIP point sources process.

Completed chapters (as of June 1997) and those in progress in the EIIP Point Sources volume⁴ are listed in Table 5-1. These documents have been compiled with the goal of

producing thoroughly explained procedures that can be used to develop consistent and complete estimates of emissions from significant point sources. Quality assurance and data organization issues specific to the source category are also covered in each chapter.

TABLE 5-1. POINT SOURCES VOLUME CHAPTERS

| Source Category | Chapter Status (June 1997) |
|---|---------------------------------------|
| Introduction | In Progress |
| Boilers | Complete |
| Hot-Mix Asphalt Plants | Complete |
| Equipment Leak Fugitives | Complete |
| Wastewater Collection and Treatment | Complete |
| Surface Coating | Complete |
| Semiconductor Manufacturing | In Progress |
| Paint and Ink Manufacturing | Complete |
| Metals Production | In Progress |
| Oil and Gas Field Production and Processing | In Progress |

5.2 AREA SOURCES

The Area Sources Committee has focused on area sources that primarily emit ozone precursors, and have either been difficult to characterize in previous inventories, have been large contributors, or are sources that may have changed substantially in recent years. Chapters in the EIIP Area Sources volume⁵ and their completion status as of June 1997 are listed in Table 5-2.

TABLE 5-2. AREA SOURCES VOLUME CHAPTERS

| Source Category | Chapter Status (June 1997) |
|---------------------------------|-------------------------------|
| Introduction | Complete |
| Residential Wood Burning | Complete |
| Architectural Surface Coating | Complete |
| Dry Cleaning | Complete |
| Consumer/Commercial Solvent Use | Complete |
| Graphic Arts | Complete |
| Solvent Cleaning | In Progress |
| Industrial Surface Coating | In Progress |
| Pesticide Application | In Progress |
| Gasoline Marketing | In Progress |
| Autobody Refinishing | In Progress |
| Petroleum Loading/Unloading | In Progress |
| Traffic Markings | Complete |
| Landfills | In Progress |
| Open Burning | In Progress |
| Asphalt Paving | In Progress |

5.3 MOBILE SOURCES

The Mobile Sources Committee has focused on improving and standardizing the methods for developing locality-specific model input data for the MOBILE5 and the EMFAC onroad emissions models. Guidance work has also addressed improving vehicle miles traveled (VMT) data collection and non-road mobile emissions estimation methods. Chapters in the EIIP Mobile Sources volume⁶ and their completion status as of June 1997 are listed in Table 5-3.

TABLE 5-3. MOBILE SOURCES VOLUME CHAPTERS

| Chapter Title | Chapter Status (June 1997) |
|--|---------------------------------------|
| Methodology for Gathering Locality-Specific Inventory Data | Complete |
| Use of Locality-Specific Transportation Data for the Development of Mobile Source Emission Inventories | Complete |
| Inputs for the Non-road Emission Model | In Progress |
| Improved Mapping of Highway Performance Monitoring System (HPMS) Data to the MOBILE Model | In Progress |

5.4 BIOGENIC SOURCES

Biogenic sources can be responsible for a large share of VOC and NO emissions in some areas. The processes that lead to emissions are complex and require mathematical models for their estimation. The Biogenic Sources Committee's goal has been to provide emission inventory preparers with a basic understanding of the science behind the models for estimating biogenic emissions of VOC and NO. The completed biogenic sources volume⁷ includes discussion and methods for estimating emissions from biogenic sources: VOC from forest and agricultural land use types, and NO from agricultural soils; and also other natural sources: NO_x from lightning, and VOC from oil and gas seeps.

5.5 QUALITY ASSURANCE

The Quality Assurance (QA) Committee is motivated by the idea that a well-developed and implemented QA program fosters confidence in the inventory. Because inventories such as the PEI are the basis of many regulatory decisions, good quality assurance/quality control (QA/QC) is crucial in avoiding errors and enhancing inventory quality. The committee's goals

are to improve, consolidate, and document preferred and alternative QA/QC practices and procedures. Ultimately, using the EIIP QA approach should result in an increased confidence in the data shared among agencies, and a common basis for quality comparisons.

The QA Committee's work has included a volume on quality assurance topics and techniques,⁸ the application of the Data Attribute Rating System (DARS) to state and local level emission inventories, training sessions for state, local and EPA personnel on the use of DARS, and the development of DARS software. Chapters in the EIIP Quality Assurance Volume are complete and they are presented in Table 5-4. The DARS software, which will be completed in September 1997, is also a significant product from this group.

DARS uses a ratings system to assign scores to a system of inventory attributes. When the scores are combined, a single composite score reflects the overall quality of an emission estimate made using the rated method. The importance to inventory preparers is two-fold: first, as a way to evaluate potential estimation methods during the planning stage of an inventory, and second, as a way to evaluate the overall quality of the resulting inventory, and make comparisons with other inventories. EPA strongly encourages states to apply the DARS methods and DARS software to their 1996 PEI data as a means of improving overall inventory quality.

TABLE 5-4. QUALITY ASSURANCE VOLUME CHAPTERS

| Chapter Title | Chapter Status (June 1997) |
|--|---------------------------------------|
| Introduction: The Value of QA/QC | Complete |
| Planning and Documentation | Complete |
| General QA/QC Methods | Complete |
| Evaluating the Uncertainty of Emission Estimates | Complete |
| Model QA Plan | Complete |

5.6 DATA MANAGEMENT

The results of the Data Management Committee's work will directly affect inventory data submissions format and content. The committee's goal has been to develop and facilitate an improved data exchange mechanism for the emission inventory community. The approach taken has been to:

- Build consensus among states and local agencies, EPA, and industry;
- Identify a data transfer protocol;
- Standardize data transfer and definitions;
- Build working relationships, not regulations;
- Provide options and opportunity to achieve more for less money; and
- Make use of emerging technology.

Data Management Committee products will include users guides to the data model (now in external review and available on the CHIEF BBS) and data transfer format, an implementation guideline for EDI translation, a "shopper's guide" to EDI translation software, prototype demonstration, and user training on the data model and data transfer format. The EIIP data model is discussed in more detail in Section 3.2.



6.0 REFERENCES

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APPENDIX A

DATA DICTIONARY FOR REPORTING REQUIREMENTS DATA ELEMENTS

APPENDIX A

The definitions provided below refer to the individual data element inventory reporting requirements specified in this report in Chapter 2, Tables 2-1 through 2-5. Tables A-1 through A-4 cross reference the data elements from Chapter 2 with EIIP data entity and attribute names.

Point source data elements

Activity/throughput (annual)

A measurable factor or parameter that is directly or indirectly related to the emissions of an air pollution source. Depending on the type of source category, activity information may refer to the amount of fuel combusted, the amount of a raw material processed, the amount of a product that is manufactured, the amount of a material that is handled or processed, population, employment, number of units, or miles travelled. Activity information is typically the value that is multiplied against an emission factor to generate an emissions estimate.

Annual Emissions

Actual emissions for a plant, point, or process, either measured or calculated.

Ash Content

Inert residual portion of a fuel.

Boiler Design Capacity

A measure of the size of a boiler, based on the reported maximum continuous steam flow. Capacity is calculated in units of MMBtu/hr.

Control Device Type

The name of the type of control device (e.g., wet scrubber, flaring, or process change).

County FIPS

Federal Information Placement System (FIPS). FIPS is the system of unique numeric codes developed by the government to identify states, counties, towns, and townships for the entire United States, Puerto Rico, and Guam.

Day/wk in operations

Days per week that the emitting process operates.

Emission Factor

Ratio relating emissions of a specific pollutant to an activity or material throughput level.

Exit Gas Flow Rate

Numeric value of stack gas flow rate.

Exit Gas Velocity

Numeric value of an exit gas stream.

Exit Gas Temperature

Numeric value of an exit gas stream.

Fall Throughput (%)

Portion of throughput for the three Fall months. This represents the expression of annual activity information on the basis of four seasons, typically spring, summer, fall, and winter. It can be represented either as a percentage of the annual activity (e.g., production in summer is 40% of the year's production), or in terms of the units of the activity (e.g., out of 600 units produced, spring = 150 units, summer = 250 units, fall = 150 units, and winter = 50 units).

Federal ID Code (plant)

Unique codes for a plant or facility, containing one or more pollutant-emitting sources.

Federal ID Code (point)

Unique codes for the point of generation of emissions, typically a physical piece of equipment.

Federal ID Code (process)

Unique codes for a single process or unit of operation that emits pollutants.

Federal ID Code (stack)

Unique codes for the point where emissions from one or more processes are released into the atmosphere.

Heat content

The thermal heat energy content of a solid, liquid, or gaseous fuel. Fuel heat content is typically expressed in units of Btu/lb of fuel, Btu/gal of fuel, joules/kg of fuel, etc.

Hr/day in operations

Hours per day that the emitting process operates.

Maximum Design Rate

Maximum fuel use rate based on the equipment's or process' physical size or operational capabilities.

Maximum Nameplate Capacity

A measure of the size of a generator, and is put on the unit's nameplate by the manufacturer. The data element is reported in MW or KW.

Physical address

Street address of facility.

Pollutant Code

A unique code for each reported pollutant that has been assigned in the EIIP Data Model. Character names are used for criteria pollutants, while Chemical Abstracts Service (CAS) numbers are used for all other pollutants. Some states may be using SAROAD codes for pollutants, but these should be able to be mapped to the EIIP Data Model pollutant codes.

Primary Control Efficiency

The emission reduction efficiency of a primary control device, which shows the amount of reduction of a particular pollutant from a process' emissions due to controls or material change. Control efficiency is usually expressed as a percentage or in tenths.

Rule Effectiveness % (RE%)

The measure of a regulatory program to achieve all of the emission reductions possible, which reflects the assumption that controls are typically not 100 percent effective, because of equipment downtime, upsets, decreases in control efficiencies, and other deficiencies in emission estimates. RE is used to adjust the control efficiency.

SCC

Source category code. A process-level code that describes the equipment or operation emitting pollutants.

Secondary Control Efficiency

The emission reduction efficiency of a secondary control device, which shows the amount of reduction of a particular pollutant from a process' emissions due to controls or material change. Control efficiency is usually expressed as a percentage or in tenths.

SIC code

Standard Industrial Classification code. U.S. Department of Commerce's categorization of businesses by their products or services.

Site Name

The name of the facility.

Spring Throughput (%)

Portion of throughput or activity for the three spring months. See the definition of Fall Throughput.

Stack Height

Stack physical height above the surrounding terrain.

Stack Diameter

Stack physical diameter.

Start Date (inventory year)

The calendar year that the emissions estimates were calculated for and are applicable to.

Start time (hour)

Start time (if available) that was applicable and used for calculations of emissions estimates.

State FIPS

Federal Information Placement System (FIPS). FIPS is the system of unique numeric codes developed by the government to identify states, counties, towns, and townships for the entire United States, Puerto Rico, and Guam.

Summer Throughput (%)

Portion of throughput or activity for the three summer months. See the definition of Fall Throughput.

Sulfur Content

Sulfur content of a fuel, usually expressed as a percentage.

Winter Throughput (%)

Portion of throughput or activity for the three winter months. See the definition of Fall Throughput.

Wk/yr in operations

Weeks per year that the emitting process operates.

Work Weekday Emissions

Average day's emissions. The NET inventory provides average summer, or ozone season, day emissions.

X coordinate (latitude)

East-west geographic coordinate of a stack.

Y coordinate (longitude)

North-south geographic coordinate of a stack.

Area Source Data Elements

Activity/Throughput

A measurable factor or parameter that is directly or indirectly related to the emissions of an air pollution source. Depending on the type of source category, activity information may refer to the amount of fuel combusted, the amount of a raw material processed, the amount of a product that is manufactured, the amount of a material that is handled or processed, population, employment, number of units, or miles travelled. Activity information is typically the value that is multiplied against an emission factor to generate an emissions estimate.

Annual Emissions

Actual emissions for an area source.

Control Efficiency (%)

The emission reduction efficiency, which shows the amount of reduction of a particular pollutant from a process' emissions due to controls or material change. Control efficiency is usually expressed as a percentage or in tenths.

County FIPS

Federal Information Placement System (FIPS). FIPS is the system of unique numeric codes developed by the government to identify states, counties, towns, and townships for the entire United States, Puerto Rico, and Guam.

Day/wk in operations

Days per week that the emitting process operates.

Emission Factor

Ratio relating emissions of a specific pollutant to an activity or material throughput level.

Fall Throughput (%)

Portion of throughput or activity for the three fall months. This represents the expression of annual activity information on the basis of four seasons, typically spring, summer, fall, and winter. It can be represented either as a percentage of the annual activity (e.g., production in summer is 40% of the year's production), or in terms of the units of the activity (e.g., out of 600 units produced, spring = 150 units, summer = 250 units, fall = 150 units, and winter = 50 units).

Hr/day in operations

Hours per day that the emitting process operates.

Pollutant Code

A unique code for each reported pollutant that has been assigned in the EIIP Data Model. Character names are used for criteria pollutants, while Chemical Abstracts Service (CAS) numbers are used for all other pollutants. Some states may be using SAROAD codes for pollutants, but these should be able to be mapped to the EIIP Data Model pollutant codes.

Rule Penetration (%) (RP%)

The percentage of an area source category that is covered by an applicable regulation.

Rule Effectiveness (%) (RE%)

Source Category Code

Source category code. A code that identifies the process, equipment, operation or the industry emitting pollutants.

Spring Throughput (%)

Portion of throughput or activity for the three spring months. See the definition of Fall Throughput.

Start Date (inventory year)

The calendar year that the emissions estimates were calculated for and are applicable to.

State FIPS

Federal Information Placement System (FIPS). FIPS is the system of unique numeric codes developed by the government to identify states, counties, towns, and townships for the entire United States, Puerto Rico, and Guam.

Summer/winter work weekday emissions

Emissions for an average day. The NET inventory provides average summer, or ozone season, day emissions.

Summer Throughput (%)

Portion of throughput or activity for the three summer months. See the definition of Fall Throughput.

Winter Throughput (%)

Portion of throughput for the three winter months. See the definition of Fall Throughput.

Wk/yr in operations

Weeks per year that the emitting process operates.

Onroad and Non-Road Mobile Sources

Activity Information

Activity is a measurable factor that is directly or indirectly related to the amount of pollutants emitted. For onroad mobile sources, activity is typically vehicle miles of travel (VMT). For non-road mobile sources, activity may be factors such as fuel used or estimated hours of use.

Annual Emissions

Calculated emissions for the year for the source category.

County FIPS Code

Federal Information Placement System (FIPS). FIPS is the system of unique numeric codes developed by the government to identify states, counties, towns, and townships for the entire United States, Puerto Rico, and Guam.

Emission Factor

Ratio relating emissions of a specific pollutant to an activity, in the case of onroad mobile sources, VMT.

Non-road Mobile Source Equipment Types

The categories of non-road mobile source emissions as defined by EPA's Office of Mobile Sources and documented in the EPA guidance document Procedures for Emissions Inventory Preparation, Volume IV: Mobile Sources (EPA-450/4-81-026d). The categories included but not limited to are:

- Aircraft
- Locomotives
- Commercial Marine Vessels
- Other Equipment and Engine Types
 - Lawn and Garden Equipment
 - Construction Vehicles
 - Agricultural Vehicles
 - Industrial Equipment
 - Airport Service Equipment
 - Recreational Equipment
 - Logging Equipment
 - Recreational Marine Equipment
 - Light Commercial Equipment

Within the subcategories of Other Equipment and Engine Types are more specific categories of equipment, such as leaf blowers, shredders and tillers in the Lawn and Garden Equipment category.

Onroad Mobile Source Category

The categories of onroad mobile source emissions as defined by EPA's Office of Mobile Sources and the MOBILE model. The recognized categories are:

- light duty gasoline vehicles
- light duty gasoline trucks I
- light duty gasoline trucks II
- light duty diesel vehicles
- light duty diesel trucks
- heavy duty gasoline vehicles
- heavy duty diesel vehicles
- motorcycles

Pollutant Code

A unique code for each reported pollutant that has been assigned in the EIIP Data Model. Character names are used for criteria pollutants, while Chemical Abstracts Service (CAS) numbers are used for all other pollutants. Some states may be using SAROAD codes for pollutants, but these should be able to be mapped to the EIIP Data Model pollutant codes.

Source Category Code (VMT)

Travel (VMT) is an expression of vehicle activity that is usually expressed in terms of grams per mile of travel. VMT does not directly correlate to emissions that occur while the vehicle is not moving. These non-moving emissions are incorporated into EPA's MOBILE model emission factors.

Source Category Code (Equipment Type)

See Non-Road Mobile Source Equipment Types

Start Date (inventory year)

The calendar year that the emissions estimates were calculated for and are applicable to.

State FIPS Code

Federal Information Placement System (FIPS). FIPS is the system of unique numeric codes developed by the government to identify states, counties, towns, and townships for the entire United States, Puerto Rico, and Guam.

Summer winter work weekday emissions

Emissions for an average day. The NET inventory provides average summer, or ozone season, day emissions.

Vehicle Miles of Travel

VMT is an expression of vehicle activity that is used with emission factors. The emission factors are usually expressed in terms of grams per mile of travel. Since VMT does not directly correlate to emissions that occur while the vehicle is not moving, these non-moving emissions are incorporated into EPA's MOBILE model emission factors.

Biogenic and Geogenic Sources

Annual Emissions

Calculated emissions for the year for the source category. Annual emissions are usually not developed for biogenic sources. The NET inventory provides annual numbers for geogenic sources.

County FIPS Code

Federal Information Placement System (FIPS). FIPS is the system of unique numeric codes developed by the government to identify states, counties, towns, and townships for the entire United States, Puerto Rico, and Guam.

Pollutant Code

A unique code for each reported pollutant that has been assigned in the EIIP Data Model. Character names are used for criteria pollutants, while Chemical Abstracts Service (CAS) numbers are used for all other pollutants. Some states may be using SAROAD codes for pollutants, but these should be able to be mapped to the EIIP Data Model pollutant codes.

Source Category Code

Source category code. A code that identifies the process emitting pollutants.

Start date (inventory year)

The calendar year that the emissions estimates were calculated for and are applicable to.

State FIPS Code

Federal Information Placement System (FIPS). FIPS is the system of unique numeric codes developed by the government to identify states, counties, towns, and townships for the entire United States, Puerto Rico, and Guam.

Summer/winter work weekday emissions

Emissions for a single day. Geogenic sources reported in the NET inventory are for an average summer day. Biogenic sources should have the modeled day emissions reported.

TABLE A1-1. PEI AND NET INVENTORY DATA ELEMENT AND EHIP ENTITY AND ATTRIBUTE CROSS REFERENCE FOR POINT SOURCES

| Data Elements | EHIP Entity | EHIP Attribute |
|------------------------------|---------------------|--|
| Start Date (inventory year) | Emissions | Start Date/Time |
| Start time (hour) | Emissions | Start Date/Time |
| State FIPS | Geographic Location | State/Province/Territory |
| County FIPS | Geographic Location | County/Parish/Reservatio |
| SIC code | Site/Source | SIC |
| Federal ID Code (plant) | Site/Source | Federal ID Code |
| Federal ID Code (point) | Emission Unit | Federal ID Code |
| Process ID Code | Emission Process | Process ID Code |
| Site Name | Site/Source | Site Name |
| Physical address | Site/Source | Physical Street Address |
| SCC | Emission Process | SCC |
| Pollutant Code | Emissions | Pollutant Code |
| Emission Factor | Emission Factors | Numeric Factor |
| Heat content | Emission Process | Heat content |
| Sulfur Content | Emission Process | Sulfur Content |
| Ash Content | Emission Process | Ash Content |
| Activity throughput (annual) | Activity | Start Date/Time Process Rate/Throughput |
| Winter Throughput (%) | Emission Process | Winter Throughput (%) |
| Spring Throughput (%) | Emission Process | Spring Throughput (%) |
| Summer Throughput (%) | Emission Process | Summer Throughput (%) |
| Fall Throughput (%) | Emission Process | Fall Throughput (%) |
| Hr/day in operations | Emission Process | Hours per Day |
| Day/wk in operations | Emission Process | Days per Week |
| Wk/yr in operations | Emission Process | Weeks per Year |
| Boiler Design Capacity | Emission Unit | Design Capacity |
| Maximum Design Rate | Emission Unit | Design Capacity |

TABLE A1-1. PEI AND NET INVENTORY DATA ELEMENT AND EIIP ENTITY AND ATTRIBUTE CROSS REFERENCE FOR POINT SOURCES (CONTINUED)

| Data Elements | EIIP Entity | EIIP Attribute |
|------------------------------|-------------------------------|--|
| Maximum Nameplate Capacity | Emission Unit | Design Capacity |
| Primary Control Efficiency | Control Equipment | Percent Control |
| Secondary Control Efficiency | Control Equipment | Percent Control |
| Control Device Type | Control Equipment | Device Type |
| Rule Effectiveness % | Aggregate Controls as Applied | Rule Effectiveness |
| Annual Emissions | Emissions | Start Date/Time Numeric Value |
| Work Weekday Emissions | Emissions | Start Date/Time Emission Type Numeric Value End Date/Time |
| Federal ID Code (Stack | Emission Release Point | Federal ID Code |
| X coordinate (latitude) | Geographic | X Coordinate |
| Y coordinate (longitude) | Geographic | Y Coordinate |
| Stack Height | Stack Physical | Stack Height |
| Stack Diameter | Stack Physical | Stack Diameter |
| Exit Gas Flow Rate | Stack Physical | Exit Gas Flow Rate |
| Exit Gas Velocity | Stack Physical | Exit Gas Velocity |
| Exit Gas Temperature | Stack Physical | Exit Gas Temperature |

TABLE A1-2. PEI AND NET INVENTORY DATA ELEMENT AND EIIP ENTITY AND ATTRIBUTE CROSS REFERENCE FOR AREA SOURCES

| Data Elements | EIIP Entity | EIIP Attribute |
|--------------------------------------|-------------------------------|--|
| Start Date (inventory year) | Emissions | Start Date/Time |
| Start time (hour) | Emissions | Start Date/Time |
| State FIPS | Geographic Location | State/Province/Territory |
| County FIPS | Geographic Location | County/Parish/Reservatio |
| Source Category Code | Emission Process | AMS Code |
| Pollutant Code | Emissions | Pollutant Code |
| Emission Factor | Emission Factors | Numeric Value |
| Activity/Throughput | Activity | Start Date/Time Process Rate/Throughput |
| Winter Throughput (%) | Emission Process | Winter Throughput (%) |
| Spring Throughput (%) | Emission Process | Spring Throughput (%) |
| Summer Throughput (%) | Emission Process | Summer Throughput (%) |
| Fall Throughput (%) | Emission Process | Fall Throughput (%) |
| Hr/day in operations | Emission process | Hours Per Day |
| Day/wk in operations | Emission process | Days per Week |
| Wk/yr in operations | Emission process | Weeks per Year |
| Control Efficiency (%) | Control Equipment Properties | Percent Control Efficiency |
| Rule Effectiveness (%) | Aggregate Controls as Applied | Rule Effectiveness |
| Rule Penetration (%) | Aggregate Controls as Applied | Rule Penetration |
| Annual Emissions | Emissions | Start Date/Time Numeric Value |
| Summer/winter work weekday emissions | Emissions | Start Date/Time Emission Type Numeric Value End Date/Time |

TABLE A1-3. PEI AND NET INVENTORY DATA ELEMENT AND EHP ENTITY AND ATTRIBUTE CROSS REFERENCE FOR ON ROAD AND NONROAD SOURCES

| Data Elements | EHP Entity | EHP Attribute |
|--------------------------------------|---------------------|--|
| Start Date (inventory year) | Emissions | Start Date/Time |
| Start time (hour) | Emissions | Start Date/Time |
| State FIPS | Geographic Location | State/Province/Territory |
| County FIPS | Geographic Location | County/Parish/Reservation |
| Source Category Code | Emission Process | AMS Code |
| Pollutant Code | Emissions | Pollutant Code |
| Emission Factor | Emission Factors | Numeric Value |
| Activity | Schedule | Process Rate/Throughput |
| Annual Emissions | Emissions | Start Date/Time Numeric Value |
| Summer/winter work weekday emissions | Emissions | Start Date/Time Emission Type Numeric Value End Date/Time |

TABLE A1-4. PEI AND NET INVENTORY DATA ELEMENT AND EHP ENTITY AND ATTRIBUTE CROSS REFERENCE FOR BIOGENIC AND GEOGENIC SOURCES

| Data Elements | EHP Entity | EHP Attribute |
|--|---------------------|--|
| Start Date (inventory year) | Emissions | Start Date/Time |
| Start time (hour) | Emissions | Start Date/Time |
| State FIPS | Geographic Location | State/Province/Territory |
| County FIPS | Geographic Location | County/Parish/Reservation |
| Source Category Code | Emission Process | AMS Code |
| Pollutant Code | Emissions | Pollutant Code |
| Annual Emissions | Emissions | Start Date/Time Numeric Value |
| Summer/winter work weekday emissions (modeled day emissions) | Emissions | Start Date/Time Emission Type Numeric Value End Date/Time |

TECHNICAL REPORT DATA

(PLEASE READ INSTRUCTIONS ON THE REVERSE BEFORE COMPLETING)

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| 16. ABSTRACT THIS DOCUMENT PROVIDES GUIDANCE TO STATE AND LOCAL AGENCIES FOR THE PREPARATION AND SUBMITTAL OF EMISSION INVENTORIES FOR CALENDAR YEAR 1996. THE DOCUMENT DISCUSSES TWO TYPES OF EMISSION INVENTORY SUBMITTALS. THE FIRST TYPE IS THE PERIODIC EMISSION INVENTORIES WHICH ARE REQUIRED FOR ALL OZONE AND CARBON MONOXIDE NONATTAINMENT AREAS. THE SECOND TYPE IS EPA'S NATIONAL EMISSION TRENDS (NET) INVENTORY WHICH IS A COMPREHENSIVE NATIONAL INVENTORY COVERING BOTH CRITERIA AND AIR TOXIC POLLUTANTS FOR EACH COUNTY IN THE UNITED STATES. TOPICS COVERED BY THIS GUIDANCE ARE DATA REPORTING REQUIREMENTS, ELECTRONIC DATA REPORTING REQUIREMENTS, DOCUMENTATION REQUIREMENTS, AND A SUMMARY OF AVAILABLE RESOURCES ON HOW TO PREPARE THESE EMISSION INVENTORIES. | | | | |
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