United States
Environmental Protection
Agency

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

February 1990

Air

EPA

Guidance for Initiating Ozone/CO SIP Emission Inventories Pursuant to the 1990 Clean Air Act Amendments

GUIDANCE FOR INITIATING OZONE/CO SIP EMISSION INVENTORIES PURSUANT TO THE 1990 CLEAN AIR ACT AMENDMENTS

Prepared for:

Emission Inventory Branch
Technical Support Division
Office Of Air Quality Planning And Standards
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Prepared by:

Radian Corporation
3200 Progress Center
Post Office Box 13000
Research Triangle Park, North Carolina 27709

February 13, 1991

DISCLAIMER

This report has been reviewed by the Office of Air Quality Planning and Standards, U. S. Environmental Protection Agency, and has been approved for publication as received from the contractor. The contents reflect the views and policies of the Agency, but any mention of trade names or commercial products does not constitute endorsement or recommendation for use.

ACKNOWLEDGEMENT

The National Air Data Branch (NADB) of the U.S. Environmental Protection Agency's (EPA's) Office of Air Quality Planning and Standards (OAQPS) is gratefully thanked for providing the necessary guidance on data management and reporting requirements.

EXECUTIVE SUMMARY

After considerable legislative debate and negotiation, a new Clean Air Act Bill was passed by Congress in October 1990 and signed into law by President Bush on November 15, 1990. The Bill is known as the Clean Air Act Amendments (CAAA) of 1990. November 15, 1990 is considered the date of enactment of the CAAA. Title I of the CAAA addresses the topic of nonattainment with national ambient air quality standards (NAAQS), including standards for ozone and carbon monoxide (CO). Ozone and CO nonattainment areas and their respective State Implementation Plan (SIP) emission inventories are the focus of the discussion in this guidance document.

Under the CAAA, States will have a large responsibility to inventory emissions contributing to NAAQS nonattainment, to track these emissions over time, and to ensure that control strategies are being implemented that reduce emissions and move areas towards attainment. In regards to emission inventories, the requirements of Title I continue and embellish many of the programs initiated under the previously proposed Post-1987 Ozone/CO Policy (52 FR 45044). However, the amendments also contain several specific requirements pertaining to emission inventory development that are new or that supersede those contained in the previous proposed policy. The basic purpose of this document is to provide States with an overview of the emission inventory requirements resulting from the CAAA of 1990 and to contrast these requirements with those contained in the previously proposed Post-1987 Policy. In addition to summarizing the inventory implications of the new Act, this document also contains a timeline that States should use as a planning tool for the preparation and submittal of their base year inventories and a discussion of new guidance that EPA will be issuing to support the requirements of the CAAA.

For ozone and CO, the CAAA establish nonattainment area classifications and inventory requirements ranked according to the severity of the area's air pollution problem. The extent of an area's inventory requirements is directly relatable to the

degree that it exceeds the respective ozone or CO NAAQS. For ozone, there are five nonattainment classifications known as Marginal, Moderate, Serious, Severe, and Extreme. The classifications are based on ranges of ozone design values. The classifications are summarized below by design value and required attainment date.

Ozone Nonattainment Classifications

Area Class	Design Value (ppm)	Attainment Date
Marginal	0.121 up to 0.138	3 years after enactment (Nov. 15, 1993)
Moderate	0.138 up to 0.160	6 years after enactment (Nov. 15, 1996)
Serious	0.160 up to 0.180	9 years after enactment (Nov. 15, 1999)
Severe	0.180 up to 0.280	15 years after enactment (Nov. 15, 2005)*
Extreme	0.280 and above	20 years after enactment (Nov. 15, 2010)

*The date for attainment for Severe areas with design values between 0.190 up to 0.280 is November 15, 2007 [Section 181 (a)(2)].

Two classifications are contained in the CAAA for CO nonattainment areas, Moderate and Severe. The design values and attainment dates for these classifications are listed as follows.

CO Nonattainment Classifications

Area Class	Design Value (ppm)	Attainment Date
Moderate	9.1 to 16.4	December 31, 1995
Serious	16.5 and above	December 31, 2000

The number and type of emission inventories that are required for an area under the CAAA is a function of the nonattainment classification the area falls into. Several different types of inventories are either explicitly or implicitly required in the

CAAA. For ozone, there are essentially four different kinds of inventories that are needed: 1) base year inventory; 2) periodic inventory; 3) Reasonable Further Progress (RFP) projection inventory; and 4) modeling inventory. The base year inventory is the primary inventory from which all of the other three are derived. For CO nonattainment areas, three principal types of inventories exist. These include: 1) base year inventory; 2) periodic inventory; and 3) modeling inventory. As with ozone, all of the subsequent CO inventories have their origin in the base year inventory. The requirements and applicability of each of these ozone and CO inventories are described in detail in this document.

This document focuses on the base year inventory. Generally, a 1990 base year inventory will be required. States should begin the preparation of their 1990 base year inventories immediately even though additional guidance from EPA is still forthcoming. States should initiate data collection activities for point sources now and begin determining how inventories possibly prepared under the proposed Post-1987 Policy may be useful to the effort. States that prepare and submit 1987, 1988, or 1989 base year inventories may be able to update portions of the previous inventory to 1990 to satisfy the 1990 base year inventory requirements. States should work through their respective EPA Regional office to determine if updating will be allowed. General factors to consider when conducting updates for point, area, and mobile sources are discussed in the document.

For CAAA base year inventories, EPA is requiring that States prepare an Inventory Preparation Plan (IPP) as a first step in the process of developing the 1990 base year inventories. The plans should be brief but should describe how the agencies involved in preparing the inventories intend to develop, document, and submit their inventories. The basic point of having the plans will be to give States the opportunity to tell EPA upfront how they plan to compile the required inventories and allow for EPA feedback in an effort to avoid States using approaches that are unacceptable to EPA. States need to be aware that EPA will not accept a base year

inventory for review from a State until EPA has received, reviewed, and approved of an IPP for that inventory. States should begin preparing IPPs immediately based on the guidance provided in this report.

With a few exceptions, States will be able to compile 1990 base year inventories using much of the procedural guidance issued in connection with the proposed Post-1987 Policy. Most of the primary features such as the pollutants of concern, the source types of concern, and the application of rule effectiveness are virtually unchanged from the previous guidance. Two items that are changed, however, are the requirement to include biogenic emissions and the need to use an updated version of MOBILE4, for mobile source estimates. Biogenic emissions estimates are required for all ozone nonattainment areas. EPA will supply States with the means to determine biogenic emissions. In May 1991, EPA plans to release MOBILE4.1, a revised version of its mobile source emission factor model. The updated model replaces MOBILE4 and will be required in the development of all 1990 base year inventories.

Base year inventories developed and submitted under the CAAA will also be required to conform to more standardized and rigorous reporting and documentation provisions than previous inventories. The written report summarizing the inventory results and documenting how the results were compiled, and the computerized data management aspects of inventory development will both be more scrutinized by EPA for 1990 inventories. All ozone/CO SIP inventory data submitted to EPA under 1990 CAAA requirements must be in an Aerometric Information Retrieval System (AIRS)-compatible format in order for it to be acceptable. A description of EPA's planned reporting and data management provisions is provided in this document.

The general timeline established by EPA for the preparation and submittal of the 1990 base year inventories is shown in Figure 1. States should begin preparing IPPs and collecting point source emission estimation data by February 1991. Area and mobile source emission estimation work should begin by July 1991. Complete draft base

year emission inventories will be accepted for review as early as January 1, 1992, but they must be submitted by May 1, 1992 at the latest. The point source portion of the inventories must be completed and submitted for review in the period of January - March 1992. After receiving EPA comments, States need to revise the inventories and submit them in final form by November 15, 1992.

As indicated in Figure 1, EPA plans on issuing additional guidance to States on various inventory aspects during the spring/summer of 1991. This guidance will address such items as emission inventory requirements, development of inventories to support urban airshed modeling, area and mobile source emission estimation procedures, emissions projections, and the use of MOBILE4.1.

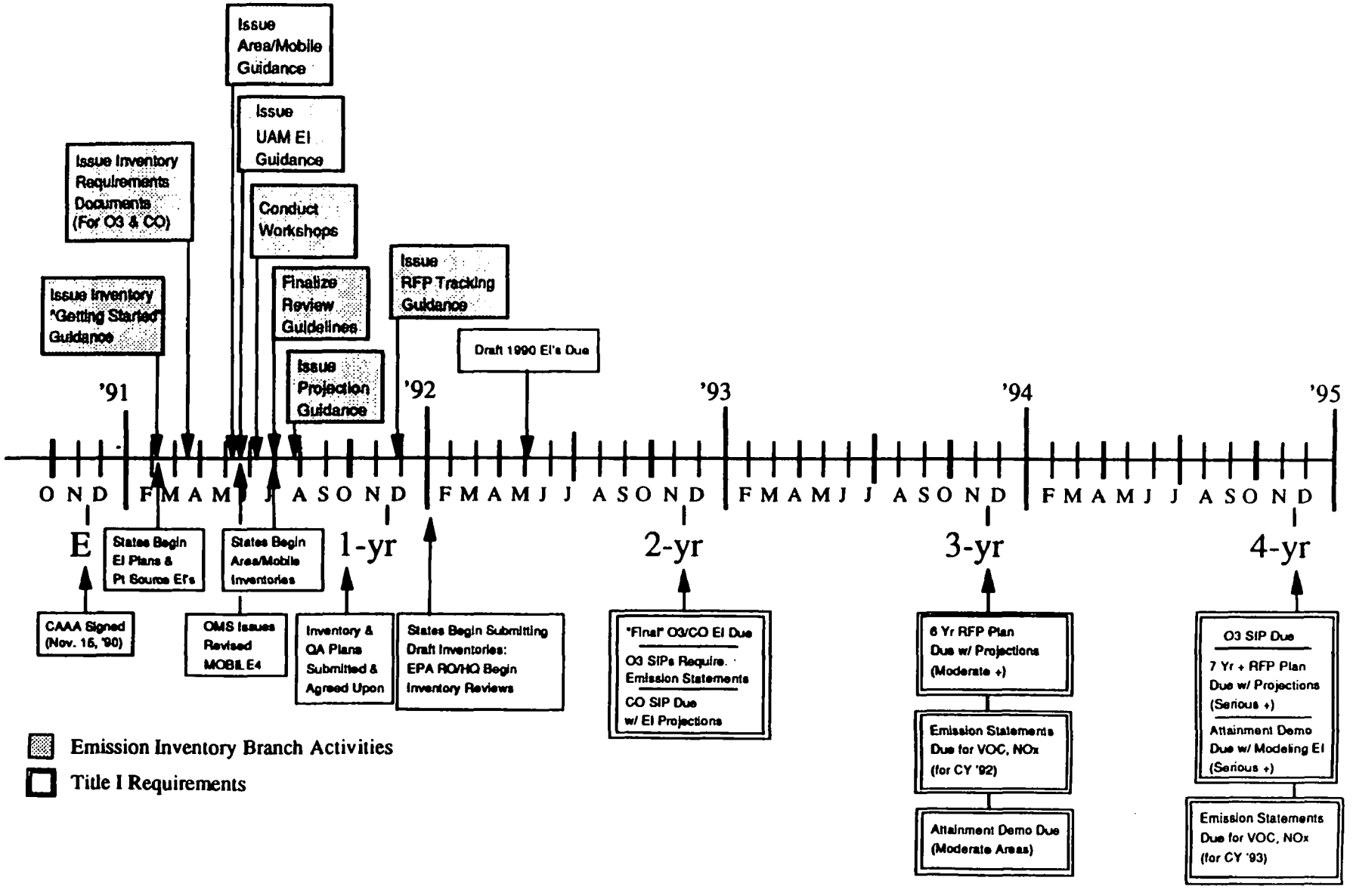

Figure 1. Title I Ozone/CO Emission Inventory Timeline

TABLE OF CONTENTS

TABLE OF CONTENTS

1.0 BACKGROUND AND PURPOSE

In 1989 sweeping revisions to the Clean Air Act were proposed that were designed to curb three major threats to the nation's environment and to the health and welfare of millions of Americans: urban air pollution, toxic air emissions, and acid rain. The proposal also called for establishing a national permits program to make the law more workable, and an improved enforcement program to help ensure better compliance with the new Act provisions. A new Clean Air Act Bill was enacted on November 15, 1990 and is known as the Clean Air Act Amendments (CAAA) of 1990.

The CAAA of 1990 create a new, balanced strategy for the Nation to attack the problem of urban air pollution. Overall, the new law reveals the Congress's high expectations of the States and the Federal government (EPA). Title I of the CAAA addresses the problem of nonattainment with national ambient air quality standards (NAAQS), including standards for ozone and carbon monoxide (CO). While it gives more time to attain the NAAQS, up to 20 years for ozone in Los Angeles, it also requires States to make constant progress in reducing emissions. It requires the Federal government to reduce emissions from automobiles, trucks, and buses: from consumer products such as hair spray and window washing compounds; and from ships and barges during loading and unloading of petroleum products. The Federal government must also develop the technical guidelines that States need to control stationary sources. States will have a large responsibility to inventory emissions contributing to NAAQS nonattainment, to track these emissions over time, and to ensure that control strategies are being implemented that reduce emissions and move areas closer to attainment.

In terms of these activities for States, the requirements of Title I essentially continue and embellish many of the programs initiated under the previously proposed Post-1987 Ozone/CO Policy (52 FR 45044, November 24, 1987), particularly in regards to compiling emission inventories. The CAAA contain several specific requirements

pertaining to emission inventory development, all of which supersede those contained in the previously proposed Post-1987 Policy and its associated guidance materials. The CAAA duplicate some of the proposed Post-1987 policies and guidance, modify some of the material, and contain several new elements not found in the Post-1987 Policy. Under the CAAA, a State's emission inventory obligations are generally related to its relative ozone/CO nonattainment classification and the extent of emissions reduction that must occur in order for an area to come into attainment. Simply stated, the higher above the NAAQS an area's ozone/CO concentrations are, the greater its emission inventory requirements.

Since States will be facing increased emission inventory responsibilities under the CAAA, EPA will be producing additional guidance to aid States in understanding and responding to the new requirements. **The basic purpose of this discussion is to provide States with an overview of the emission inventory requirements of the CAAA of 1990 and to contrast these requirements with those contained in the previously proposed Post-1987 Policy.** In addition to summarizing the inventory implications of the new Act, this discussion will preliminarily communicate to States EPA's expectations and requirements in regards to inventory preparation and submittal. The discussion also directs States as to what parts of their required inventories they should be initiating; describes the CAAA and EPA schedules that have been specified for inventory development and submittal, guidance preparation, and training; and describes the types of inventory-related guidance that is planned by EPA for 1991 to help States respond to the new Act and its inventory requirements.

The intent of providing this information to States now and in this form is to alert States as quickly as possible to the kinds of ozone/CO inventory requirements and challenges they will be facing under the CAAA and of EPA's expectations concerning activities necessary to fulfill those requirements. It should be noted, however, that for some of the inventory questions, final policy decisions and guidance are not yet available, and thus, these areas are not extensively covered in this discussion. EPA is

aggressively working on all unresolved questions and is committed to finalizing decisions on all fronts in the next several months. Specifics on this are covered in Section 6.0. As final policies and guidance become available, EPA will communicate them to States. Subsequent guidance material issued by EPA will not cause States to have to re-do efforts that were initiated by this guidance document.

The subsequent discussion is divided into six sections. These sections address: 1) an overview of Title I of the CAAA (Section 2.0), 2) impacts of the CAAA on the proposed Post-1987 Policy and related guidance (Section 3.0), 3) new inventory requirements under the CAAA (Section 4.0), 4) planned inventory schedules and milestones (Section 5.0), 5) additional guidance that is forthcoming for inventory development under the CAAA (Section 6.0), and 6) existing EPA guidance that is available on ozone/CO SIP inventory development (Section 7.0). Questions regarding specific aspects of the emission inventory information in this discussion should first be directed to the respective Regional Office contact person for ozone/CO emission inventories. If additional information is required, contact the Chief, Inventory Guidance and Evaluation Section, Emission Inventory Branch (MD-14), Technical Support Division, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711. The telephone number is (919) 541-5575 (FTS 629-5575). Questions on EPA policy and the overall requirements for ozone and CO SIPs should be directed to the Chief, Ozone/CO Policy Development Section, Ozone/CO Programs Branch (MD-15), Air Quality Management Division, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711. The telephone number is (919) 541-5517 (FTS 629-5517).

2.0 OVERVIEW OF EMISSION INVENTORY REQUIREMENTS UNDER TITLE I OF THE CAAA

2.1 Nonattainment Classifications

For ozone and CO, the CAAA establish nonattainment area classifications and inventory requirements ranked according to the severity of the area's air pollution problem. **For ozone, there are five nonattainment classifications known as Marginal, Moderate, Serious, Severe, and Extreme [Section 181(a)].** The classifications are based on ranges of ozone design values developed over the time period 1987 to 1989. Each of the 96 areas currently designated as being in nonattainment of the ozone National Ambient Air Quality Standard (NAAQS) has been placed into one of the classifications. The design value ranges and the attainment date for each classification are given below [Section 181(a) (1),(2)].

Ozone Nonattainment Classifications

Area Class	Design Value (ppm)	Attainment Date
Marginal	0.121 up to 0.138	3 years after enactment (Nov. 15, 1993)
Moderate	0.138 up to 0.160	6 years after enactment (Nov. 15, 1996)
Serious	0.160 up to 0.180	9 years after enactment (Nov. 15, 1999)
Severe	0.180 up to 0.280	15 years after enactment (Nov. 15, 2005)*
Extreme	0.280 and above	20 years after enactment (Nov. 15, 2010)

*An exception is made to the schedules for attainment dates above for Severe areas with design values between 0.190 up to 0.280 based on 1986-1988 air quality data [Section 181(a)(2)]. For these areas, the attainment date is 17 years after enactment or November 15, 2007.

Two classifications are contained in the CAAA for CO nonattainment areas. These two groupings, known as Moderate and Serious, are defined as follows [Section 186(a)(1)].

CO Nonattainment Classifications

Area Class	Design Value (ppm)	Attainment Date
Moderate	9.1 to 16.4	December 31, 1995
Serious	16.5 and above	December 31, 2000

Even though they are still classified as Moderate areas, CO nonattainment areas with design values greater than 12.7 ppm have more stringent requirements than do Moderate areas with values in the 9.1 up to 12.7 range (Section 187). The extra requirements involve compiling additional vehicle miles travelled (VMT) projections [187 (a)(2)(A)], preparing contingency plans if projected VMT levels are not met and attainment is not achieved [187 (a)(2)(B)(3)], establishing enhanced vehicle inspection and maintenance (I/M) programs [187 (a)(2)(B)(6)], and preparing specific plans to demonstrate that attainment and necessary annual emission reductions will be met [187 (a)(2)(B)(7)].

Two 1-year extensions for reaching ozone or CO attainment are available to States if: 1) all SIP requirements and commitments for an area were met and 2) no more than one exceedance of the ozone or CO NAAQS occurred in the year preceding the extension year [Section 181 (a)(5) and Section 186 (a)(4)].

The emission inventories required to be compiled under each ozone and CO classification are presented in Section 2.2.

2.2 Emission Inventory Delineations and Definitions

The type and number of emission inventories that are required under the CAAA is generally a function of the nonattainment category an area falls into. Basic inventory types required either explicitly or implicitly in the CAAA are described below.

2.2.1 Ozone Nonattainment Inventories

For ozone nonattainment areas, there are essentially four basic kinds of inventories that are required under the CAAA. These four are identified as:

- Base year inventory,
- Periodic inventory,
- Reasonable Further Progress (RFP) Projection inventory, and
- Modeling inventory.

The base year inventory is the primary inventory from which all of the other three required inventories are derived. It serves as the basis of the emissions configuration for a nonattainment area. The CAAA call for this inventory to be a comprehensive, accurate, and current inventory of actual emissions [Section 182(a)(1)]. The inventory shall include emissions of VOC, NO_x, and CO from stationary point and area sources, highway mobile sources, and non-highway mobile sources. Both anthropogenic and biogenic emission sources shall be included in the inventory. Emissions are to be based on conditions that exist during the peak ozone season (generally summertime) of the year of enactment of the CAAA, i.e., 1990. Industrial activity, population, VMT, etc. and emissions must represent a typical peak ozone season weekday for the base year 1990.

The term "typical ozone season weekday" refers to activities that occur during the summer on weekdays, averaged on a daily basis. For example, if during the

summer weekdays of 1990 (Monday - Fridays, June - August) a manufacturing process produces 12,000 tons of material, and this period includes 13 weeks, 5 weekdays per week, then the average or "typical" ozone season weekday activity would be: 12,000/(13 x 5) = 185 tons/day. This value would then be multiplied by the emission factor, control factor, and rule effectiveness factor, if applicable, to calculate the typical ozone season weekday emissions.

Emissions and related activities shall also be reported on an annual average basis for 1990 for documentation purposes. Temperatures to be used in evaporative loss estimate calculations should be drawn from the mean of those occurring during the highest ozone exceedance episode days over the last three to four years. More specific guidance concerning temperature calculations will be issued by May 1991.

The CAAA require moderate, serious, severe, and extreme ozone nonattainment areas to submit a plan within three years of the date of enactment to reduce VOC emissions by 15 percent within six years after enactment. A baseline level of emissions, from which the 15 percent reduction is calculated, is determined by adjusting the base year inventory to exclude biogenic emissions and to exclude certain emission reductions not creditable towards the 15 percent. The adjusted base year inventory represents the inventory that is the basis from which the 15 percent reduction is then calculated. The adjusted base year inventory equals the base year inventory minus biogenic emissions, emission reductions from Federal Motor Vehicle Control Program (FMVCP) regulations promulgated prior to January 1, 1990, and emission reductions from RVP rules promulgated prior to CAAA enactment or required under CAAA Section 211(h). Only VOC and NO_x emissions have to be addressed in adjusted inventories [Section 182 (b)(1)(B)].

Reasonable Further Progress (RFP) Projection inventories are necessary under the CAAA for demonstrating strategies by which the required RFP emission reductions will be achieved. The first requirement for RFP projection inventories is to

show how the required 15 percent emission reduction over the first six years after enactment will be achieved [Section 182 (b)(1)(A) and (c)(2)(B)]. This requirement applies to ozone nonattainment areas classified as moderate or above. The base year for this projection inventory is 1996 and it must be submitted in final form by November 15, 1993. In addition to the projection for 1996, emission projections should be summarized for intermediate years (1991 through 1995). More information on the content and format of the 1996 RFP projection inventory and intermediate year projection summaries will be included in RFP projection guidance to be issued in November 1991.

The 1996 projection inventory is to be based on allowable rates of emissions, activity, etc. for both VOC and NO_x rather than assuming the current rates will be maintained in the future year. These allowables are to be determined by what is dictated by instituted regulatory limits. For example, for a SIP regulation limiting a furniture manufacturer to 0.05 lbs of VOC used per gallon of coating applied, the allowable solvent content of the coating should be used to calculate emissions in year 6, even if a specific manufacturer is currently using only 0.02 lbs VOC/gallon coating. Because activity levels for this example (gallons coating applied per day or per year) are not limited by regulations, they would be determined by applying base year activity levels against growth factors approved by EPA. For evaporative loss emission sources where temperature is used in the calculation of emissions, the projection inventory should use the same temperatures used in the base year inventory. Future year effects of the FMVCP must be modeled using an updated version of MOBILE4 that will be issued in May 1991. In the case of California, an approved mobile model based upon the State's program would be used.

The CAAA further require that serious, severe, and extreme ozone nonattainment areas demonstrate that VOC emissions will be reduced by at least 3 percent per year (in addition to the initial 15 percent reductions) averaged over each 3-year period beginning six years after enactment and lasting until attainment is reached. RFP Projection inventories are also used to demonstrate how these continued reductions

will be achieved. As with the 1996 percent RFP projection inventory, projection summaries are required for years prior to the end of each 3-year interval and like the 1996 RFP projection inventory, the 3 year 3 percent projection inventories are based on allowable emissions, activity levels, etc. established by statutory regulations rather than current emissions. If activity levels are limited by regulation, then the upper limit is used to project emissions. If not regulated, then the current actual activity level must be multiplied by EPA-approved growth factors to calculate projected activity levels. As was specified for the year 6 projection inventory, evaporative loss emission sources should apply the same temperatures used in the base year inventory for the 3 year 3 percent projection inventories. These projection inventories, in conjunction with periodic inventories, will be used to track RFP achievement. More information on projection inventories and projecting emissions will be provided in projections guidance to be completed in July 1991, and in RFP tracking guidance to be completed in November 1991.

Periodic inventories are required to be compiled under the CAAA by all classifications of ozone nonattainment areas [Section 182 (a)(3)(A)]. Periodic inventories are to be based on actual emissions and shall cover VOC and NO_x emission sources. Like the base year inventory, periodic inventories are to be based on peak ozone season temperatures, industrial activity, etc. [Annual activity and/or emissions data must also be provided with the inventory for documentation purposes.] The base year for the first periodic inventory will be 1993. Thereafter, the base year will be every third year, e.g., 1996, 1999, etc. The primary function of the periodic inventories is to track emission reductions, particularly relating to RFP requirements. For serious areas and above, the CAAA require that 6 years after the date of enactment and every 3 years thereafter, States shall demonstrate that the RFP reduction requirements were met [Section 182 (g)(1)]. This will be accomplished at least in part by comparing the periodic inventories to base year 1990 inventories to ensure that emissions were reduced during the preceding intervals equivalent to the total emission level required to be achieved by the end of the interval.

The final version of each periodic inventory is required to be submitted no later than the end of each 3-year period after submission of the final base year inventory, until the area is redesignated to attainment [Section 182 (a)(3)(A)]. However, because the periodic inventories will be used in part to demonstrate whether or not the RFP reduction requirements were in fact met, these inventories must be submitted as close to each milestone date as is feasible. More information will be provided on periodic inventories in guidance on RFP tracking to be completed in November 1991.

Modeling inventories must be compiled for ozone nonattainment areas where photochemical grid modeling is required (i.e., serious areas and above and multi-state moderate areas) [Section 182 (c)(2)(A) and 182 (j)(1)(B)] and where modeling is necessary for demonstration of attainment but photochemical grid modeling is not specifically required (i.e., moderate areas that are not part of a multi-state region) [Section 182 (b)(1)(A)]. Both a base year and a projected modeling inventory are needed. For the photochemical grid modeling inventories, hourly emission estimates will be required that are specific to the designated peak ozone episodic days. The designated days will be defined using guidance on the application of the Urban Airshed Model (UAM) to be issued in May 1991. Designated day temperatures will be required to estimate emissions properly. For areas needing to perform some type of an attainment demonstration but that are not specifically required to perform photochemical grid modeling (i.e., moderate areas in non multi-state regions), the 1990 base year emission inventory rates can be used after conversion to an hourly basis.

For modeling inventories, VOC, NO_x, and CO emissions are to be inventoried from anthropogenic and biogenic sources. Emissions have to be temporally allocated, speciated, and spatially gridded for the purposes of photochemical modeling. The base year modeling inventory will use actual emission rates. The emission rates, while not necessarily identical, should be consistent with those developed for the 1990 base year inventory unless episode days for years other than 1990 are to be modeled. For those cases, significant adjustments to the inventory should be reflected (e.g., if 1988

is modeled, 1988 VMT should be used). It should be noted that the geographical area for the modeling inventory will extend beyond the geographic boundaries of the particular nonattainment area.

The projected modeling inventory will use allowable emission rates dictated by regulatory limits. The rates should be consistent with those found in the RFP tracking projection inventory for the year of attainment. Additional guidance will be forthcoming on how to run the updated MOBILE4 emission factor model to produce hourly mobile source emission estimates needed for photochemical grid modeling. This guidance will be issued in May 1991.

2.2.2 CO Nonattainment Inventories

For CO nonattainment areas, the requirements of the CAAA necessitate that three types of emission inventories be assembled. These three types include base year inventories, periodic inventories, and modeling inventories [Section 187 (a)(1), (a)(5), (a)(7), and 187 (d)(1)]. The base year inventory is the primary inventory from which all other CO inventories are derived. It establishes the basis for determining rate of progress requirements, and is used as the basis for periodic inventories and attainment demonstrations. The base year CO inventory is defined in the CAAA to be a "current inventory." EPA interprets this to mean an inventory for 1990 (year of enactment). The inventory is to address actual CO emissions during the peak CO season for the area. All stationary point and area sources and highway/non-highway mobiles sources are to be included in the compilation. Peak CO season should reflect the months when peak CO air quality concentrations occur. For many, but not all, areas of the country, the peak CO season will be in the wintertime months. For areas where winter is the peak CO season, the 1990 base year inventory will include the winter months beginning in 1989 and extending into 1990 (e.g., December 1989 and January-February 1990). Emissions are to be based on peak 8-hour period emissions during the designated CO season. The peak 8-hour period of emissions is determined by the peak air quality violations.

Periodic CO inventories essentially require the same information as the base year inventory. The primary difference between them is the basis year for the inventory. The first periodic inventory must be based on 1993 information [Section 187 (a)]. It is due in final form no later than September 30, 1995, and subsequent ones no later than the end of each 3-year period thereafter until the area is redesignated to attainment [Section 187 (a)(5)]. Periodic CO inventories are to address actual CO emissions during the CO season on a peak 8-hour basis. Periodic inventories will play a role in Milestone Demonstrations. More guidance on this role will be forthcoming in March 1991.

Similar to ozone, modeling inventories are necessary for CO because of CAAA provisions that require Attainment Demonstrations to be made for certain CO nonattainment areas [Section 187 (a)(7) and 187 (d)(1)]. Moderate areas exceeding a design value of 12.7 ppm must submit an attainment plan before November 15, 1992 that projects how attainment will be achieved by December 31, 1995. The same requirement exists for serious areas except that attainment must be demonstrated by December 31, 2000. Base year and projected modeling inventories will be needed. The precise type of inventory required and its level of detail will be dictated by whether a proportional rollback approach can be used or gridded dispersion modeling is required. EPA will provide direction to States on this question for specific nonattainment areas in the future.

As with the ozone modeling inventories, the CO base year modeling inventory represents actual emissions in the base year CO season. Emissions would be determined for the peak 8-hour period during the peak CO season. All stationary point and area sources and all mobile source types must be included in the inventory. Activity levels and production data used to calculate emissions should represent actual data. Conversely, the projection modeling inventory would be based on allowable emissions dictated by regulatory limits, and not actual emissions. The emission levels in effect will represent the results the State expects from its SIP control strategies. Activity levels

used to estimate emissions should be those expected in the future attainment year (i.e., 1995 for moderate areas or 2000 for serious areas).

2.2.3 Summary of Inventory Requirements

The types of inventories that are required to be compiled under each different nonattainment categorization are delineated below. Requirements for Emissions Statements are also summarized.

Ozone Nonattainment Areas

Marginal Areas:

a) Base Year Inventory -- Required by November 15, 1992, base year is 1990, includes actual emissions of VOC, NO_x, and CO. An adjusted base year inventory is also required by November 15, 1992, and serves as the starting point for emission reduction calculations. The adjusted base year inventory equals the 1990 base year inventory less biogenic emissions and specific exclusions for emission reductions achieved from RVP regulations promulgated prior to enactment and the FMVCP prior to January 1, 1990.

b) Emissions Statements -- State required by November 15, 1992 to revise SIP to require owner/operator of sources of VOC and NO_x (with emissions > 25 tons/yr) to provide statement showing actual emissions, must verify that the data are accurate, first submission by November 15, 1993 and annual updates thereafter.

c) Periodic Inventory -- Required no later than November 15, 1995, however, must be submitted as soon after the end of the base year as is feasible. Base year for inventory is 1993. (If attainment is not demonstrated by 1993, the area is bumped up to the Moderate classification level and must comply with all of the inventory requirements of that classification.)

Moderate Areas:

a) Base Year Inventory -- Same requirements as Marginal Area

b) Emissions Statements -- Same requirements as Marginal Area

c) Periodic Inventory -- Same requirements as Marginal Area except a periodic inventory is due every three years after the initial submittal until the area is redesignated to attainment (base years are 1993 and 1996).

d) RFP Projected Inventory for Year 6 (1996) -- Inventory takes the adjusted base year inventory and projects it into the future to 1996 to demonstrate that the required 15 percent reduction will be achieved. The inventory includes VOC and NO_x emissions, and is based on allowable emissions dictated by regulatory limits. The base year for the projection inventory is 1996 and it has to be submitted in final form by November 15, 1993. In addition, inventory projections must be summarized for intermediate years (1991-1995) and submitted with the 1996 projection.

e) Modeling Inventory -- By November 15, 1993, the State must make a demonstration that its plan provides for attainment by the applicable date. To make the Attainment Demonstration, base year and projected modeling inventories are needed. The base year modeling inventory will be derived from the 1990 base year inventory but must reflect significant changes in conditions and activities of the episode days, while the projected modeling inventory will have a 1996 base year. The projected modeling inventory will be used to determine if the proposed SIP control strategies are adequate to reach attainment by the designated date.

Serious Areas:

a) Base Year Inventory -- Same requirements as Moderate Area

b) Emissions Statements -- Same requirements as Moderate Area

c) Periodic Inventory -- Same requirements as Moderate Area (base years are 1993, 1996, and 1999)

d) RFP Projected Inventory for Year 6 (1996) -- Same requirements as Moderate Areas

e) RFP Projected Inventory for Year 9 (1999) -- By November 15, 1994 the State must submit an inventory that projects how the 3 percent per year RFP reduction requirement over 3 years (years 1996-1999) will be achieved. The inventory includes VOC and NO_x emissions, and is based on allowable emissions dictated by regulatory limits. Projections must be summarized for intermediate years (1997-1999).

f) Modeling Inventory -- By November 15, 1994, the State must make a demonstration that its plan provides for attainment by the applicable date. To make the Attainment Demonstration, base year and projected modeling inventories are needed since the CAAA require that photochemical grid modeling or EPA-approved alternative be used. The base year modeling inventory will be derived from the 1990 base year inventory but must reflect significant changes in conditions and activities of the episode days, while the projected modeling inventory will have a 1999 base year. Both inventories will require considerably more detailed data than either the 1990 base year or the projected base year inventory. The projected modeling inventory will be used to determine if the proposed SIP control strategies are adequate to reach attainment by the designated date.

Severe Areas:

a) Base Year Inventory -- Same requirements as Serious Area

b) Emissions Statements -- Same requirements as Serious Area

c) Periodic Inventory -- Same requirements as Serious Area (base years are 1993, 1996, 1999, 2002, and 2005. For areas over 0.190 ppm, an additional inventory for 2007 would be required.)

d) RFP Projected Inventory for Year 6 (1996) -- Same requirements as Serious Areas

e) RFP Projected Inventory for Year 9 (1999) -- Same requirements as Serious Area

f) RFP Projected Inventory for Year 12 (2002) -- By November 15, 1994 the State must submit an inventory that projects how the 3 percent per year RFP reduction requirement over 3 years (years 1999-2002) will be achieved. The inventory includes VOC and NO_x emissions, and is based on allowable emissions dictated by

regulatory limits. Projections must be summarized for intermediate years.

g) RFP Projected Inventory for Years 15 (2005) -- By November 15, 1994 the State must submit an inventory that projects how the 3 percent per year RFP reduction requirement over 3 years (years 2002-2005) will be achieved. [An exception to this requirements is: for severe areas with a design day value over 0.190 ppm, the period of attainment is extended out to 2007]. The inventory includes VOC and NO_x emissions, and is based on allowable emissions dictated by regulatory limits. Projections must be summarized for intermediate years.

h) Modeling Inventory -- By November 15, 1994, the State must make a demonstration that its plan provides for attainment by the applicable date. To make the Attainment Demonstration, base year and projected modeling inventories are needed since the CAAA require that photochemical grid modeling or EPA-approved alternative be used. The base year modeling inventory will be derived from the 1990 base year inventory but must reflect significant changes in conditions and activities of the episode days, while the projected modeling inventory will have a 2005 (or 2007 for areas over 0.190 ppm) base year. Both inventories will require considerably more detailed data than either the 1990 base year or the projected base year inventory. The projected modeling inventory will be used to determine if the proposed SIP control strategies are adequate to reach attainment by the designated date.

Extreme Areas:

a) Base Year Inventory -- Same requirements as Severe Areas

b) Emissions Statements -- Same requirements as Severe Areas

c) Periodic Inventory -- Same requirements as Severe Areas (base years are 1993, 1996, 1999, 2002, 2005, 2008, and 2010)

d) RFP Projected Inventory for Year 6 (1996) -- Same requirements as Severe Areas

e) RFP Projected Inventory for Year 9 (1999) -- Same requirements as Severe Areas

f) RFP Projected Inventory for Year 12 (2002) -- Same requirements as Severe Areas

g) RFP Projected Inventory for Year 15 (2005) -- By November 15, 1994 the State must submit an inventory that projects how the 3 percent per year RFP reduction requirement over 3 years (years 2002-2005) will be achieved. The inventory includes VOC and NO_x emissions, and is based on allowable emissions dictated by regulatory limits. Projections must be summarized for intermediate years.

h) RFP Projected Inventory for Year 18 (2008) -- By November 15, 1994 the State must submit an inventory that projects how the 3 percent per year RFP reduction requirement over 3 years (years 2005-2008) will be achieved. The inventory includes VOC and NO_x emissions, and is based on allowable emissions dictated by regulatory limits. Projections must be summarized for intermediate years.

i) RFP Projected Inventory for Year 20 (2010) -- By November 15, 1994 the State must submit an inventory that projects how the 3 percent per year RFP reduction requirement over years 2008 to 2010 will be achieved. The inventory includes VOC and NO_x emissions, and is based on allowable emissions dictated by regulatory limits. Projections must be summarized for intermediate years.

j) Modeling Inventory -- By November 15, 1994, the State must make a demonstration that its plan provides for attainment by the applicable date. To make the Attainment Demonstration, base year and projected modeling inventories are needed since the CAAA require that photochemical grid modeling or EPA-approved alternative be used. The base year modeling inventory will be derived from the 1990 base year inventory but must reflect significant changes in conditions and activities of the episode days, while the projected modeling inventory will have a 2010 base year. Both inventories will require considerably more detailed data than either the 1990 base year or the projected base year inventory. The projected modeling inventory will be used to determine if the proposed SIP control strategies are adequate to reach attainment by the designated date.

CO Nonattainment Areas

Moderate Areas:

a) Base Year Inventory -- Required by November 15, 1992, base year is 1990, only pollutant inventoried is CO, represents actual emissions on a peak 8-hour period basis in the CO season

b) Periodic Inventory -- A revised base year inventory is required to be submitted no later than September 30, 1995, and every 3 years thereafter until the area is redesignated to attainment, represents actual emissions.

c) Modeling Inventory -- Areas exceeding a design value of 12.7 must submit an attainment demonstration plan by November 15, 1992 that demonstrates attainment by December 31, 1995. To make the Attainment Demonstration, base year and projected modeling inventories are needed. The level of inventory detail is dictated by whether proportional rollback or gridded dispersion modeling is required. The base year modeling inventory will have a base year consistent with the CO season, while the projected modeling inventory will have a 1995 base year. The projected modeling inventory will be used to determine if the proposed SIP control strategies are adequate to reach attainment by the designated date.

Serious Areas:

a) Base Year Inventory -- Same requirements as Moderate Areas

b) Periodic Inventory -- Same requirements as Moderate Areas

c) Modeling Inventory -- Serious areas must submit an attainment demonstration plan by November 15, 1992 that demonstrates attainment by December 31, 2000. To make the Attainment Demonstration, base year and projected modeling inventories are needed. The level of inventory detail is dictated by whether proportional rollback or gridded dispersion modeling is required. The base year modeling inventory will have a base year consistent with the CO season, while the projected modeling inventory will have a 2000 base year. The projected modeling inventory will be used to determine if the proposed SIP control strategies are adequate to reach attainment by the designated date.

3.0 IMPACT OF CAAA ON THE PROPOSED POST-1987 O_3/CO POLICY AND GUIDANCE

The purpose of this section is to describe how the major emission inventory elements of the proposed Post-1987 O_3/CO Policy and the guidance materials issued to support it (identified in Section 7.0) have been affected by the CAAA. The discussion identifies the key inventory components of the previously proposed policy and describes how they have or have not been changed by the CAAA. The impacts discussed here principally apply to the development of the base year inventory.

3.1 Primary Pollutants of Interest

The pollutants of interest for ozone and CO base year inventories under the CAAA remain unchanged from those examined under the proposed Post-1987 Policy. For ozone inventories, VOC, NO_x and CO emissions from stationary point and area, off-highway mobile, and highway mobile sources are still required to be inventoried. For CO inventories, CO emissions from the same source types have to be investigated. Information concerning pollutants to be inventoried issued under the proposed Post-1987 Policy is still valid.

3.2 Source Types to be Inventoried

The types of sources to be included in base year inventories under the CAAA are very similar to those found in the proposed Post-1987 Policy, with the exception that biogenic emission sources have to be included in the ozone inventories. More details on the specific requirements for biogenic emissions are given in Section 4.0 on new inventory requirements. Excluding the biogenics requirement, ozone and CO base year inventories are still required to address stationary point and area sources, off-highway mobile sources, and highway mobile sources. The lists of VOC, NO_x, and CO

point, area, and mobile source categories given in the previous Requirements Documents (EPA 450/4-88-019 and EPA 450/4-88-020) are still valid as categories that, at a minimum, must be addressed in the base year inventory. However, formats for reporting 1990 emission inventory data will differ from previous requirements. Information on formats and systems for data reporting is contained in Section 4.8. **States should also be aware that EPA's Joint Emission Inventory Oversight Group (JEIOG) is currently conducting projects to identify missing or misclassified source categories, particularly for area sources. These projects will produce additional lists of source categories that must be included in the base year inventory.** These source category lists will be included in the area source guidance that EPA will issue in May 1991.

3.3 Inventory Base Year

Under the CAAA, the base year for ozone and CO SIP inventories is 1990. Under the proposed Post-1987 Policy, States receiving SIP calls in 1988 could use either a 1987 or 1988 base year for their inventories, while States included in a second round of SIP calls were allowed to prepare 1989 base year inventories. Many States have compiled or begun compiling base year emission inventories under the old Policy using a 1987, 1988, or 1989 base year. **These inventories still have value and should not be discarded or erased.** For some areas, it may be possible, and allowed by EPA, to update the 1987/1988/1989 inventories to a 1990 base year and submit them to fulfill the base year inventory requirement under the CAAA. Details on updating 1987/1988/1989 base year inventories to 1990 are provided in a separate discussion in Section 3.11.

Even if the 1987/1988/1989 inventories are not allowed to be updated, the inventories can still be valuable tools from the standpoint of the inventory mechanisms that have been established. These mechanisms include calculation algorithms that have been set up, activity level data that have been collected, projection data that have been collected, generic data collection methods that have been established, and documentation

procedures that have been established. These tools will be of great use in gathering and developing the information required for the 1990 base year inventories.

The 1987/1988/1989 inventories may also have a significant value in connection with the performance of photochemical modeling (i.e., Urban Airshed) validation runs for episodes prior to 1990. In order to validate Airshed modeling for the 1990 base year and beyond, modeling runs must be made using historical data. The 1987/1988/1989 inventories may be able to provide the emission rate and activity level data needed to determine some of the modeling inventory emission rates. These emission rates could be used to validate the model for observed ozone episodes occurring in previous years, especially 1988. The extent to which these data will be useful for model validation will vary from area to area, but nonetheless the 1987/1988/1989 data should be maintained in some form. The mobile source data may be of limited use since they would be based on an older version of MOBILE4.

3.4 Point Source Inventory Guidance

The guidance for inventorying point sources of VOC, NO_x and CO has essentially not been changed from what was contained in the previously issued guidance document Procedures for the Preparation of Emission Inventories for Precursors of Ozone, Volume I (EPA 450/4-88-021, December 1988). For this reason, States should immediately begin data gathering for the development of the point source component of their base year inventories. There is no reason to postpone data gathering and development because no new guidance is planned for point sources that will significantly affect State's 1990 base year inventory efforts. Some refinements and enhancements may be issued to the previous guidance for selected source categories, but this information will not affect the basic activity data that States need to be collecting on individual point sources. **States are encouraged to submit the point source portion of the inventory to EPA as early as January 1, 1992.**

As under the previously proposed Post-1987 Policy, EPA will specify a point source emissions cutoff definition for VOC sources of 10 tons/yr. The point source cutoffs for NO_x and CO will remain at 100 tons/yr. While sources with emissions at these levels and above must be inventoried as individual point sources, States are encouraged to inventory sources below these cutoffs on an individual point source basis as well. **The only significant change is that for VOC sources in the 10 to 25 tons/yr emissions range, 1990 base year inventory emissions must be determined on an individual facility basis. They cannot be extrapolated from the results of a survey of a representative sample subset as was allowed under the previous guidance.**

States need to realize that these emission cutoff levels have been specifically established by EPA for the purposes of ozone/CO base year SIP emission inventories. These cutoff levels are, in several cases, not necessarily consistent with the "major source" delineations given in the CAAA for VOC, NO_x, and CO sources. This is because the two types of cutoffs are to be used for different purposes. In several cases, the Act has established other major source cutoff definitions for purposes such as the application of RACT, for new source review, and for Emissions Statements. For example, for the purposes of Emissions Statements, NO_x emission sources down to 25 tons/yr have to report emissions. In Serious CO nonattainment areas, major sources are defined as those with the potential to emit 50 tons/yr CO. However, because these other lower cutoffs exist, States should consider the benefits of going ahead and inventorying sources, especially of NO_x and CO, below 100 tons/yr if possible.

The most significant point source category guidance that EPA plans on issuing for the 1990 base year inventories deals with the overall category of waste management practices. In the previous Procedures Document, EPA did not provide extensive guidance on how to estimate emissions from waste management practices such as hazardous waste treatment, storage, and disposal facilities (TSDFs), municipal solid waste landfills, and publicly owned treatment works (POTWs) for wastewater. Since the last guidance document, the Agency has been conducting extensive regulatory

development programs for several of these categories and is now better equipped to issue technical guidance on how VOC emissions are to be best estimated. Materials available for this purpose are summarized below.

Estimating Emissions from Wastewater Treatment Plants and Hazardous Waste Treatment, Storage, Disposal Facilities

In response to requests from State and local air pollution control agencies involved in the preparation of volatile organic compound (VOC) and air toxics emissions inventories, EPA's Control Technology Center together with the Emissions Inventory Branch have developed the Surface Impoundment Modeling System (SIMS). Version 2.0 of SIMS was released in October 1990. SIMS is a personal computer software package for estimating air emissions from surface impoundments and wastewater collection devices. It can be used to estimate emissions from wastewater sources at hazardous waste treatment, storage, and disposal facilities (TSDFs), publicly owned treatment works (POTWs), industrial wastewater treatment facilities, and other similar operations.

SIMS contains models to estimate air emissions for the following types of devices: diffused air surface impoundments, junction boxes, lift stations, mechanically aerated surface impoundments, non-aerated surface impoundments, surface impoundments with an oil film, sumps, and wiers. The emissions estimates of SIMS are based on mass transfer models developed by the Emissions Standards Division (ESD) of EPA during the evaluations of TSDFs and VOC emissions from industrial wastewater. As a part of the TSDF project, a Lotus 123™ spreadsheet program called CHEMDAT7 was developed for estimating VOC emissions from wastewater land treatment systems, open landfills, closed landfills, and waste storage piles, as well as various types of surface impoundments. Contact Penny Lassiter at (919) 541-5396 or (FTS) 629-5396 for more information. The air emission models for wastewater used in CHEMDAT7 have been incorporated into SIMS. SIMS was developed to meet the needs of State and local regulatory personnel who may not have information on the pollutant profile (flow rate

and concentration) in the feed to wastewater treatment systems. SIMS can estimate a default inlet pollutant profile for the water discharged from any of 29 industry types.

SIMS is designed for use on an IBM™ compatible personal computer. The system is distributed on one 360 Kb diskette with a user's manual (EPA-450/4-90-019a) and background information document (EPA-450/4-90-019b). Contact Mary Ann Stewart at (919) 541-0875 or (FTS) 629-0875 for more information. To obtain copies of SIMS or the accompanying documentation, State and local agencies should contact the Control Technology Center at (919) 541-0800 or (FTS 629-0800).

Municipal solid waste landfill emission estimates can be modeled using the Landfill Air Emissions Estimation Model developed by the Control Technology Center. The system is distributed on a diskette (EPA-600/8-90-085B) with a user's guide (EPA-600/8-90-085A). Contact the Control Technology Center at (919) 541-0800 or (FTS) 629-0800 for more information.

States have reported difficulties with obtaining information on some of the parameters required for the above models. States should be aware that some default parameters are available and have been provided due to such problems. For multiple wastestreams with incomplete information, a valid method involves running representative wastestreams in the models. If more information is needed, contact State and EPA Regional Office Resource Conservation and Recovery Act (RCRA) staff. They should be able to provide information collected from facility permitting and from implementation of the new RCRA Accelerated Rule on VOC Air Emissions at TSDFs.

Hazardous waste landfill estimates can also be made by sampling at large commercial facilities. Useful sampling schemes, in order of priority, would be: samples from collectors such as vents in a closed landfill cell; use of flex chambers at several points across a landfill surface; and samples taken downwind of the landfill with back calculation used to estimate emissions.

Publications in the Air/Superfund National Technical Guidance Series could be helpful in making emissions estimates at hazardous waste landfills. There is a four volume series collectively entitled Procedures for Conducting Air Pathway Analyses for Superfund Applications. Volume I: Application of Air Pathway Analyses for Superfund Applications (EPA-450/1-89-001, NTIS PB90 113374/AS) provides a general discussion of air impacts and provisions for air pathway analysis, including emissions estimates in conjunction with atmospheric dispersion modeling. Volume II: Estimation of Baseline Air Emissions at Superfund Sites (EPA-450/1-89-002a, NTIS PB89 180053/AS) details the available methods for estimating air emissions prior to any remedial action. Methods described include direct emission measurement techniques, indirect measurements, and predictive emissions modeling. Suggestions are provided for selecting from among the range of methods available given the associated range of costs and uncertainties. Also available are Volume III: Estimation of Air Emissions from Clean-up Activities at Superfund Sites (EPA-450/1-89-003, NTIS PB89 180061/AS) and Volume IV: Procedures for Dispersion Modeling and Air Monitoring for Superfund Air Pathway Analysis (EPA-450/1-89-004, NTIS PB90 113382/AS). These volumes are available through the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161, phone (703) 487-4650.

3.5 Area Source and Mobile Source Inventory Guidance

In anticipation of the CAAA, EPA under the JEIOG program has been conducting several research projects designed to develop new or improved methodologies for determining emissions from a diverse group of stationary area source categories, off-highway mobile sources, and highway mobile sources. The goal of these projects has been to come up with better techniques for estimating emissions and activity levels used for determining emissions. EPA will issue new guidance for several source categories by May 1991. For stationary area source categories, there will be few new developments. The new guidance is expected to primarily affect off-highway mobile categories such as

airplanes and railroad trains, highway mobile source VMT determinations, and a few area source categories.

For this reason, States may want to focus primarily on developing the 1990 base year inventory for point sources until the area and mobile source guidance documents are issued. Until these documents are published, States should be working on the data collection effort for area and mobile sources relating to activity data that are historically important for a given source category. Even though some categories will have revised methodologies presented, most will still need to have the basic activity level data collected that have been important in the past. EPA will communicate to States in technical memoranda developments in the new area and mobile source guidance as they become available.

States should also be aware that for mobile sources, EPA will be issuing a new version of the mobile source emissions model in 1991. This latest version, an updated MOBILE4, is expected to be available in May 1991. Most of the changes from the current MOBILE4 are internal to the model such that the impacts on a State's use of the model for compiling its 1990 base year and adjusted base year inventories will be minimal. All nonattainment areas, except those in California, will be expected to use the updated MOBILE4 model.

3.6 Major Sources in the 25-Mile Boundary

Just as under the proposed Post-1987 Policy, EPA will require under the CAAA that 100 ton/yr and greater VOC, NO_x, and CO emission sources, located within 25 miles of the designated nonattainment area, be included in the area's 1990 base year inventory. This requirement is essentially unchanged from the previous policy. As before, States need to use good judgement in deciding which 100 ton sources to include in terms of sources near the edge but outside of the 25-mile boundary. Generally, all 100 ton sources within 25 miles of the nonattainment zone boundary must be included.

Ones just outside of the 25-mile limit may also be included if the State feels they likely contribute to the area's nonattainment problem for a variety of reasons (e.g., they have very large emissions, they are influenced by prevailing winds, etc.). It is the responsibility of the States to coordinate the exchange of inventory data for sources in the 25-mile band that may cross State boundaries.

Sources do not have to be included in an area's 25-mile boundary if they also fall into the specifically designated geographic boundaries of another nonattainment area. EPA is preparing maps of the nonattainment areas and their 25-mile boundary zones to show where overlaps occur. These maps will be distributed to the Regional Offices and be available for State use in March 1991.

3.7 Temporal Basis of Emissions

The temporal bases on which emissions must be expressed for 1990 base year inventories under the CAAA are the same as those used under the Post-1987 Policy. For ozone inventories, VOC, NO_x, and CO emissions must be determined and expressed on an ozone season daily basis. The daily basis should reflect a typical weekday operation during the peak ozone season months (usually June - August). For CO nonattainment area inventories, emissions must be determined and expressed on the basis of peak 8-hour period emissions during the season of maximum CO violations. Peak CO violations usually occur during the wintertime months in most areas. States can use other time periods for the CO season provided they can document that the alternative period used represents the highest CO air quality period.

States are reminded that for the purpose of photochemical modeling, temporal factors are also required to determine hourly profiles of emissions by category for a summer weekday, Saturday, and/or Sunday.

3.8 Rule Effectiveness

At this time, the requirements of the CAAA do not cause any changes in EPA's previously issued requirements regarding the application of Rule Effectiveness in calculating base year emissions. The Rule Effectiveness guidance issued in connection with the proposed Post-1987 Policy is still in force and is expected to remain so for the purposes of the CAAA inventories. In addition to the Procedures Document referenced earlier, States should also consult the EPA report Procedures for Estimating and Applying Rule Effectiveness in Post-1987 Base Year Emission Inventories for Ozone and Carbon Monoxide State Implementation Plans (published in June 1989) for detailed guidance on how to incorporate Rule Effectiveness into their 1990 base year inventories.

3.9 Emissions Projections

Under the inventory requirements of the CAAA, as under the Post-1987 Policy, States have to prepare projected emission inventories (see Section 2.2). States, therefore, will need to gather information relevant to making good emissions projections several years into the future. It is likely that States will be sending out questionnaires to industrial sources to solicit data on base year emissions and projected emissions before all of EPA's CAAA projections guidance is issued in July 1991. Examples of the kinds of questions States may want to use in questionnaires are listed below.

1. At what annual rate do you expect your business to grow or decline in the next 5 to 10 years?

2. Do you anticipate changing any current process or throughput in the next 5 to 10 years such that actual emissions of VOC, NO_x, or CO would change? If yes, explain.

3. Are process emissions expected to change in the next 5 to 10 years because a rule or regulation has required a permanent change to the operation, process, or equipment? If so, what changes?

4. Are process emissions expected to decrease in the next 5 to 10 years because of voluntary modifications to the equipment, process, or operating hours? Is the reduction in emissions permanent? Is the emission reduction required by a federally enforceable regulation or is it voluntary?

5. Are process emissions expected to change in the next 5 to 10 years due to seasonal or economic changes in facility activity? If yes, explain.

6. Are emissions expected to change because a piece of equipment or a process that was in operation in previous years will not operate in the future? If yes, explain.

7. Are process emissions expected to change because of special circumstances that are not anticipated to continue into subsequent years (e.g., operation on a variance)? If yes, explain.

3.10 Quality Assurance Plans

The quality assurance (QA) provisions for inventories present in the proposed Post-1987 Policy are still in force under the CAAA. States must design a QA program and prepare a QA plan that is consistent with the previously issued guidance documents: Guidance for the Preparation of Quality Assurance Plans for O_3/CO SIP Emission Inventories (EPA 450/4-88-023) and Quality Assurance Program for Post-1987 Ozone and Carbon Monoxide State Implementation Plan Emission Inventories (EPA 450/4-89-004). **States are required to submit QA plans as an initial step in their inventory development work and receive EPA approval on their plans early on in the process.** The QA plans must be submitted as a part of the State's Inventory Preparation Plan (IPP) which is a new requirement for the 1990 base year inventories. The full provisions and requirements of the IPPs are explained in Section 4.1. The content and general form of QA plans must be consistent with the previously issued guidance.

As an aid to States in the preparation and checking of their inventories prior to submittal to EPA, the Agency has been preparing a set of quality review

guidelines. These guidelines will contain what is essentially a checklist of items that an inventory must contain or address in order for the inventory to be considered acceptable for review by EPA. The guidelines will address whether inventories meet developed specifications for completeness, consistency (both internal and with national trends), reasonableness of emission values, and emissions documentation. EPA is projecting to issue the final review guidelines in July 1991.

3.11 Updating Previous 1987/1988/1989 Base Year Inventories

Several ozone and CO nonattainment areas that received SIP calls in 1988 or 1989 have prepared or have begun preparation of base year emission inventories per the requirements and guidance in the proposed Post-1987 O_3/CO Policy (52 FR 45044, November 24, 1987). These inventories have either 1987, 1988, or 1989 as their base year. **For the purposes of the CAAA, these inventories will have to be either updated to 1990, the year of enactment of the CAAA, or redone totally to reflect a 1990 base year. Only States which have fully completed portions of their base year inventories for 1987, 1988, or 1989 that they desire to update and have received EPA approval of these portions will be considered for approval to update. Otherwise, agencies will have to prepare a completely new inventory with a 1990 base year.** For the purposes of accuracy and providing an inventory that will meet the goals of the CAAA, EPA encourages all areas to prepare new 1990 base year inventories even if they did already assemble base year inventories for 1987/1988/1989.

States should work with their respective EPA Regional offices to determine if they can perform updates to 1987/1988/1989 inventories that may have been prepared. and to determine how these updates should be performed. Regional office questions will be resolved by EPA air headquarters staff [Office of Air Quality Planning and Standards (OAQPS)]. Before any updating can be performed on 1987/1988/1989 inventories, States will need to receive written authorization from EPA allowing them to do so. The Regions will be able to provide this authorization. EPA will not accept any updated

inventories in cases where this prior authorization is not received. For nonattainment areas that meet the above stated conditions, States should request their EPA Regional Office as soon as possible for the approval to perform an update if the State does not desire to reconstruct a 1990 base year inventory from the start. In their petition, States should clearly document the case for why they should be allowed to perform an update of the 1987/1988/1989 inventory. Once approval to perform an update is received, the State needs to prepare and submit an inventory preparation plan (IPP) as required by EPA under the CAAA (see Section 4.1 for details on the IPP requirements). The IPP must clearly specify all of the methods the State plans to use to accomplish the inventory update. The IPP must also contain a QA plan for accomplishing the update and ensuring the quality of the overall inventory.

For States that are able to perform updates to the 1987/1988/1989 base year inventories, the updating process will likely be split along the lines of point, area, off-highway mobile, and highway mobile sources. EPA plans to issue more direct formal guidance for performing updates (e.g., specific growth factors to use on an individual source category basis) in March 1991. However, for the purposes of this preliminary guidance discussion, the following general guidance should be followed.

3.11.1 Point Sources

All stationary point sources of VOC, NO_x, or CO with emissions of 100 tons/yr or greater should be re-inventoried completely and not simply updated. Existing point source guidance in the Procedures Document (EPA-450/4-88-021) should be used to inventory the major sources. Sources with emissions less than 100 tons/yr can be adjusted to the 1990 base year using scaling factors based on industrial growth for the category generally or the plant specifically. The intended approach and source of the growth factors should be fully explained in the IPP. Such an approach negates having to reanalyze the whole plant. It also means that it is not required that smaller sources be re-inventoried; however, States are encouraged to re-inventory these sources if feasible.

An updated inventory of this type would give more accurate current emissions data than could be obtained by adjusting older data with growth factors. Small VOC sources (i.e., emissions of 10 to 25 tons/yr) that were previously inventoried using sample surveys will now have to be individually inventoried, whether for updating or for inventorying from scratch.

In the one to three year span since the previous base year inventories were compiled, it is possible that new point sources could have come into being that need to be added to the 1990 base year inventory. Once new sources are identified, they should be inventoried according to the existing guidance in the Procedures Document (EPA 450/4-88-021). For major sources, additions should be obvious and well known to the State/local agencies. Similarly, major plant shutdowns or curtailments should be well documented. Other methods that States may use to identify possible new sources or identify source shutdowns include reviewing current industrial directories, reviewing recent permitting records for new plants and existing plant changes, and reviewing nationally-oriented data bases such as the Toxic Release Inventory System (TRIS) for SARA 313 reporting records. Again, the methodologies to be used should be specified in the IPP.

In cases where no changes have occurred in the number of sources, States will need to have a way to survey plants to determine if output has changed (positively or negatively) such that emissions have been affected. This survey can be very simple and general and needs to assess if any growth changes have taken place at the facility since the original base year (1987, 1988, or 1989). The process of the survey could also be used to determine growth expectations for future years that will be needed for the various projection inventories required under the CAAA (see Section 2.2). The previous base year emissions can be scaled up or down based on reported annual growth changes. This methodology will be less resource intensive than gathering a complete new set of inventory data, but more accurate than applying a single, industry-wide growth average across all plants in a given source category.

3.11.2 Area and Off-Highway Mobile Sources

Practically all of the emission estimates for area and off-highway mobile sources are based on the use of an emission factor and some activity/commodity level(s) (e.g., population, employment, equipment counts, etc.) that is a surrogate indicator of emissions. States should perform updates for these source types by examining how the surrogate activity levels have changed over the period to 1990. For most of the source categories, changes over the one to three year span will not have been large. For each area and off-highway mobile source category, States need to investigate the key emissions surrogate parameters and determine how they have changed since the previous base year inventories were developed. The Procedures Documents (EPA 450/4-88-021 and EPA 450/4-81-026d, revised) should be reviewed to determine what the key surrogates are. They will generally be expressed in the emission factor itself (e.g., lbs VOC/capita) or in a multi-step calculation process (e.g., pieces of equipment x hours of operation per piece x lbs VOC/hr of operation). In some cases, the extrapolation to 1990 will be very easy to perform because the surrogate statistics are readily available (e.g., population). In other cases, the State will have to determine new data that are very site-specific (e.g., airplane takeoff/landing cycles at an airport) to the point that the category is actually being re-done as opposed to being updated.

States are reminded that EPA will be issuing new inventory guidance for some area and off-highway mobile source categories in May 1991 that may significantly affect how emissions are to be determined. For these categories (railroads, aircraft, solvent uses), it will likely not be possible to perform updates from the previous estimates. Instead, new emission estimates will have to be prepared using the new methodology.

3.11.3 Highway Mobile Sources

Highway mobile source emission estimates must be derived from scratch using a 1990 base year for all areas, including those with 1987/1988/1989 base year inventories that were allowed to update their overall inventory. Areas with approved highway mobile source inventories for 1987, 1988, or 1989 must still develop new 1990 base year inventories. There are several reasons EPA is adopting this position. One relates to the way that mobile source models calculate emission factors. Relatively significant changes occur in the factors with fleet turnover from one model year to the next. Also, with new road construction, VMT patterns change that significantly impact mobile source emissions. These changes may involve not only more roads, but also changes in speeds both higher and lower. For example, in 1990, several interstate roads now have 65 mile per hour speed limits instead of 55. Since the highway mobile source component of these inventories is almost always the major contributor to total area emissions, it makes sense to reevaluate its emissions from year to year. The planned release of a new version of the mobile source emissions estimation model, MOBILE4.1, in May 1991 also provides additional justification for totally reevaluating mobile source emissions as opposed to trying to update them. [California can continue using the EMFAC mobile model.] The planned May 1991 release of new guidance for determining VMT further solidifies the need for States to re-calculate highway mobile source emissions for the purposes of the 1990 base year inventories under the CAAA. States should wait until the updated version of MOBILE4 and VMT development guidance is issued in May 1991 to begin construction of their 1990 highway mobile source inventories. However, State air agency staff should begin contacting Metropolitan Planning Office (MPO) personnel (or their equivalent) to become familiar with the MPO's VMT estimation methods, base years of data, and overall capabilities, and to explain to the MPO's the CAAA provisions.

4.0 NEW INVENTORY REQUIREMENTS UNDER THE CAAA

This section of the discussion focuses on the new features and requirements of the CAAA that are associated with emissions estimation and emission inventory development. Included here are discussions on inventory preparation plans (IPPs), Emissions Statements, biogenic emissions, emissions "backcasting," substitution of NO_x emission reductions for required VOC reductions, use of a new, updated MOBILE4 model, and written and computerized inventory data reporting. These discussions should be viewed as preliminary descriptions of the new features. EPA will issue more detailed guidance on Emissions Statements, the use of the updated MOBILE4, the estimation of biogenic emissions, and computerized inventory data reporting in the spring of 1991.

4.1 Inventory Preparation Plans

Under the previously proposed Post-1987 O_3/CO Policy, States were not required to tell EPA how they planned to prepare, document, and submit their base year emission inventories prior to the actual submittal of the materials. For the purposes of the CAAA and its emission inventory requirements, EPA is adopting a new approach. **For CAAA base year inventories, EPA is requiring that States prepare an Inventory Preparation Plan (IPP) that is brief but that specifies to EPA how they intend to develop, document, and submit their inventories.** The basic point of having the plans will be to give States the chance to tell EPA upfront how they plan to compile the required inventories and allow for EPA feedback in an effort to avoid States using approaches that are not consistent with EPA requirements. With the use of IPPs, EPA can help guide the preparation of inventories and hopefully produce emission estimates that are of higher quality and that are consistent with the CAAA requirements. IPPs are due in final form by October 1, 1991.

States should submit their IPPs to their respective EPA Regional Office (RO) for review, and EPA headquarters (OAQPS) should also be copied on the documents and any correspondence relating to the plans. EPA headquarters copies should be sent to: Chief, Inventory Guidance and Evaluation Section, Emission Inventory Branch (MD-14), Technical Support Division, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711.

States will need to prepare an IPP for each specific nonattainment area where base year inventories are required by the CAAA to the extent that different approaches will be used. If a State has multiple nonattainment areas but plans to use the same overall approach for each, the State can submit a single IPP that details that approach and the areas to which it will apply. **States need to be aware that EPA will not accept a base year inventory for review from a State until EPA has received, reviewed, and approved of an IPP for that inventory.** EPA approval of an IPP does not, however, signify that EPA unconditionally accepts all of the information to be contained in the actual inventory. The inventory will be reviewed separately and on its own merits regardless of how well or how poorly the IPP was assembled. In approving the IPPs submitted, EPA will be saying we accept your intended approach for inventory compilation. The results produced by these approved approaches will have to undergo a separate review and approval process.

An IPP should address how a State plans to inventory all sources (regardless of size) of the ozone pollutants (VOC, NO_x, CO) or CO for CO nonattainment areas. Separate discussions should be used to address stationary point, stationary area, off-highway mobile, highway mobile sources, and biogenics. The overall basis for a State's inventory needs to be communicated in the IPP. If an inventory started under other programs will be utilized (e.g., under the proposed Post-1987 Policy), this should be stated. Generally, the State's starting point for the base year inventory effort should be summarized.

For point sources, States need to define how all pertinent emission sources will be identified and located. The plans need to tell EPA how point source activity levels and associated parameters will be developed, and how these data will be used to calculate emission estimates. States can describe any source surveys that are planned, and if they intend on using existing data contained in systems such as NEDS, AIRS, EIS, or State permitting files. The extent to which a State plans to use EPA's AIRS and PC-SAMS data base management systems to compile their point source inventory should be explained.

For stationary area and off-highway mobile sources, the plan needs to explicitly state what source categories will be addressed and which will not because they do not occur in the nonattainment area. For those categories to be included, the plan should indicate what calculational method will be used to determine emissions. If a State plans on just following the guidance in the existing Procedures Document for all categories, they should simply report that they will be applying the EPA-recommended approaches. If the existing EPA guidance has alternative methods for a category, the IPP should clearly indicate which one the State intends to apply for its inventory. Particular emphasis should be given to categories in which the State plans to use an approach other than that recommended in the previous guidance document (i.e., the Procedures Document). Any major assumptions that will be used that would be key to the development of emission estimates in a category should be clearly stated.

For highway mobile sources, the IPP should provide a clear indication of how the State intends to develop VMT estimates and mobile source emission factors. Any predictive models that will be applied should be identified and key assumptions in the use of the models should be stated. Other items that should be addressed include specifications of the vehicle classes that will be covered, the fuel RVP level to be used, ambient temperatures to be used, I/M and anti-tampering programs that are in place, and a specification of whether or not vehicle refueling losses are being covered by the

mobile source model estimates or they are being calculated separately as an area source. The control effectiveness the State used for adopted Stage II controls should be stated.

The IPP needs to clearly describe how the State plans to present and document the inventory to EPA. The general kinds of documentation that will be provided and the form of this documentation should be described to the extent that EPA can judge if it would be satisfactory for inventory review purposes. The IPP should specify the written and computerized ways that a State plans to compile and submit its data. States must clearly delineate how State data base/data systems are to be used and how EPA systems such as AIRS, AFS, etc. are to be used. EPA believes that going through this exercise will help a State better and more efficiently plan how its inventory can be assembled.

One component that must be contained in an IPP is the QA plan for the inventory. This plan would describe the overall QA program that the State intends to use during the compilation of the inventory. The QA plan should be constructed according to the guidance provided in Section 3.10 of this discussion. Having the QA plan in the IPP is a very logical organization. The IPP will describe how the inventory is to be created and presented, and the QA plan represents a vital link to the successful and accurate development of good inventory information. Putting the QA plan in the IPP reinforces the idea that QA is an important and necessary part of the inventory development process.

Generally, EPA envisions that the IPPs will be brief. It is EPA's intent that they be concise and to the point, and only provide as much detail as is necessary to communicate to the Agency how the State intends to develop and present its inventory. However, the document needs to contain sufficient information to enable EPA to make a judgment that the intended State inventory approach is sound. Although no specific IPP format is required, the discussion should probably include the topics listed below at a minimum.

Suggested IPP Topics

A. Introduction
   - define what nonattainment area the plan is for, whether attainment for O_3, CO, or both, classification(s) of the area.
   - background/basis for the inventory (i.e., previous efforts that are viable and related), starting point
   - define how the plan is structured, what does it contain
   - specify who is responsible for the inventory and who is actually compiling it (air agency, consultants, etc.)

B. Point Sources Approach
   - how will sources be identified and located
   - how will minor sources be identified
   - define role of existing NEDS, AIRS, NAPAP, permitting data
   - identify data collection methods to be used (e.g., surveys, etc.)
   - basis for activity level data and emission estimates
   - basis for control efficiencies
   - application of rule effectiveness
   - basis for rule penetration and rule effectiveness levels

C. Area and Off-Highway Mobile Sources Approach
   - what categories will be addressed and why
   - what categories will be excluded and why
   - what estimation methods will be used (e.g., AP-42, Procedures Document, site-specific surveys, etc.)
   - methods for collecting activity/commodity level data
   - application of rule effectiveness
   - basis for rule penetration and rule effectiveness levels

D. Highway Mobile Sources Approach

- specification of how VMT are to be determined
- specification of the mobile source emissions model used (will be an updated version of MOBILE4 for every State except California)
- specification of key assumptions for the emissions model involving parameters such as temperature, speeds, existence of I/M and anti-tampering programs, incorporation of vehicle refueling losses, etc.

E. Documentation Approach

- written presentation and documentation
- computerized compilations and documentation
- use of AIRS online, or PC-SAMS and PC-AMS
- submission of data in AIRS-compatible format

F. Quality Assurance Plan

- description of QA program
- how QA program will affect and benefit inventory
- description of adherence to previously issued QA guidance

4.2 Emissions Statements

Emissions Statements represent a completely new requirement for States under the CAAA [Section 182 (a)(3)(B)]. Emissions Statements are required to be submitted in ozone nonattainment areas for all sources of VOC and NO_x emissions. Sources emitting less than 25 tons/yr of VOC or NO_x may be able to obtain a waiver from the Emissions Statements requirement if the State includes such sources in their emission inventory updates and determines emissions in a manner acceptable to EPA [Section 182 (a)(3)(B)(ii)]. **Sources with emissions of either pollutant that are equal to or greater than 25 tons/yr have to submit an Emissions Statement under all conditions.** The statements have to specify actual source emissions and contain a certification by the

source that the information is accurate to the best of their knowledge. Emissions Statements are first due to EPA in 1993 or three years after enactment of the CAAA. Thereafter, annual updates are required to be submitted. The Emissions Statement Requirements apply to all five ozone nonattainment area classifications.

EPA wants the system of Emissions Statements that States implement to be consistent across the country. The Ozone/Carbon Monoxide Programs Branch of OAQPS is currently formulating Agency policy and guidance on how the Emissions Statements requirements are to be implemented. This guidance will describe the kinds of statements that are needed and how these statements will interface (and potentially overlap) with the emission inventory requirements already imposed by the CAAA. The guidance will be structured around providing a standardized format for Emissions Statements and telling States how the values reported in the statements should mesh with their inventories.

Once all Emissions Statement specifications and requirements are complete, States will need to communicate these specs to their respective emissions sources. States will also need to have a system in place that is capable of tracking when new sources come on line that become subject to Emissions Statement requirements and when others are no longer in operation and do not need to submit statements. States will need to have a system in place to process and compile Emissions Statements and report the data to EPA as specified in final guidance. At the current time, EPA is planning on issuing final guidance for States on Emissions Statements in May 1991.

4.3 Biogenic Emissions Estimates

Under the CAAA base year emission inventory requirements for ozone nonattainment areas, States will have to prepare and submit emission estimates for biogenic emissions. Biogenic emissions estimates are required for marginal, moderate, serious, severe, and extreme areas. EPA plans to supply States with the means to

estimate biogenic emissions. The Agency has developed a model for estimating biogenic releases known as BEIS (Biogenic Emission Inventory System). EPA will provide the model to States in a PC version along with instructional guidance on its use. States will be able to run the model by basically loading it with a host of meteorological data that should be readily available for all locations. More information and guidance on the use of BEIS will be issued in the spring of 1991. The computer program, PC-BEIS, is also expected to be distributed on an EPA bulletin board at the same time as the guidance is issued.

States are strongly encouraged to use the EPA model to estimate their biogenic emissions but they are not required to do so. If States plan on using an alternative approach to estimate biogenic emissions, this approach needs to be described in detail in the State's IPP for the nonattainment area and EPA approval granted before the approach is implemented. As with the overall IPP, approval of the basic alternative inventory approach for biogenics does for automatically guarantee EPA acceptance of the estimates in the submitted inventory. They will still be subject to review and comment by the Agency.

4.4 Emissions "Backcasting"

EPA currently has underway a number of research activities to determine better methods and information resources for estimating ozone precursor emissions. The efforts are generally concentrated on stationary area, highway mobile, and off-highway mobile emission sources. To varying extents and over varying timeframes, these research efforts are expected to produce results that will impact the way that EPA will require that base year emission inventories be developed. New emission factors and emission estimating models may become available that need to be applied to the base year situation. **States should be aware that they may be called upon to "backcast" (as contrasted to forecasting) their base year emissions in the future should significantly improved estimating methods become sanctioned.** Since the base year inventory is the

basis for all other CAAA inventories, changes to the base year inventory have the potential to affect all other required inventories, and an area's required emission reductions and ultimate attainment demonstration.

EPA does not anticipate that backcasting will be routinely required to an extensive degree. Needed revisions will likely be infrequent and limited to a source category or two each time. One reason for informing the States of the potential need for this activity is to reinforce the idea that States need to document well how all emission estimates are prepared and that they need to keep good records of the inventory data and the information that supports them.

4.5 Use of NO_x Reductions to Substitute for VOC Reduction Requirements

Under the CAAA, Moderate ozone nonattainment areas and above are required to demonstrate a 15 percent reduction in VOC emissions from base year levels by 1996 [Section 182 (b)(1)(A)]. After 1996, Serious and above areas not in attainment must demonstrate that a 3 percent per year reduction is being achieved to validate that reasonable progress is being made towards attainment. **In certain situations, the Act does allow the substitution of NO_x emission reductions for required VOC reductions.**

For Moderate areas and above, NO_x reductions can be credited towards the 15 percent VOC reduction requirement, but only after the first six years after enactment (i.e., after 1996) [Section 182 (b)(1)(A)]. For Serious, Severe, and Extreme areas, NO_x reductions can be substituted for annual VOC reduction tracking requirements after 1996 [Section 182 (c)(2)(C)]. To qualify for the substitution, a State must make a demonstration to EPA that the combination of NO_x and VOC reductions is at least as effective as VOC reductions alone.

4.6 Release and Required Use of Updated MOBILE4 Model

In May of 1991, EPA plans to issue an updated version of its mobile source emissions estimation model known as MOBILE4. The updated version of MOBILE4 will replace and supersede its predecessor. States, with the exception of California, are required to use the updated version in determining highway mobile source emissions for all of their base year emission inventories. California can continue using the EMFAC mobile model. The overall application of the updated MOBILE4 for base year inventory purposes is generally the same as that used for the previously issued version of MOBILE4. The majority of the enhancements in the revised model are internal to the model and do not directly impact the user for base year inventory emission factor generation purposes. Specific guidance on the scope of the model changes and their impacts, and on the use of the model for base year inventories will be issued in May 1991.

4.7 Written Inventory Reporting and Documentation Requirements

Base year emission inventory information under the CAAA will have to be provided to EPA in both written and computerized formats. The written presentation has to contain documentation that is extensive enough for the Agency to reproduce the emission estimates that are submitted in the inventory. Written reporting/documentation requirements are summarized in this section. Computerized submittals of emissions data and documentation will have to meet the specifications set forth by EPA's National Air Data Branch (NADB). The parallel specifications for computerized submittals are presented in Section 4.8.

Under the CAAA, EPA is going to require that States prepare written inventory documentation reports according to a more standardized set of guidelines than were issued previously. Inventory reports that are not prepared according to the guidelines will be harder for EPA to review and more likely to be deemed unacceptable

by the Agency. This does not mean that every inventory report will have to be organized precisely the same and look identical. EPA's primary interest is that all inventories address the crucial elements inherent in a good inventory and provide summary data and documentation that allow the quality of the inventory effort to be effectively judged. Therefore, the emphasis is really on the types of data that need to be reported and not the specific format they are reported in. **Inventories not meeting the minimum data reporting and documentation standards established in this discussion will, however, be deemed unacceptable and returned to the States for modification before any further technical quality review will be performed.**

EPA has already published a detailed guidance document on this issue that States need to consult before preparing their written reports. This document is entitled Example Emissions Inventory Documentation for Post-1987 Ozone State Implementation Plans (EPA 450/4-89-018). If a State does not have the report, copies can be obtained from the Emission Inventory Branch of OAQPS. As the title implies, the guidance document provides a complete example of how an inventory should be compiled and documented. The kinds of summary tables and graphics that States need to provide to EPA for their base year inventories are clearly shown. The examples cover point, area, and mobile sources, and they address quality assurance aspects of the inventory. Even though the guidance was prepared for ozone inventories, the examples are equally applicable and transferrable to CO inventories. It also provides States guidance on how to summarize quality assurance activities that need to be carried out in the compilation of the inventory.

EPA's recommended outline for the organization and content of a State's inventory report is given in Table 1. The combination of the Table 1 outline with the Example Emissions Inventory Documentation report should provide States with all of the guidance necessary to prepare an inventory documentation report that will satisfy EPA and the intent of the CAAA.

The introduction to an inventory report needs to contain a description of the nonattainment area that has been inventoried; a listing of the counties covered; a map of the area including the 25-mile boundary outside of the nonattainment area; an identification of who prepared the inventory and who are the respective contacts for major inventory components; a description of major inventory problems or deficiencies; and a discussion of how the remainder of the report is organized. After the introduction, the report needs to contain a thorough summary of the emissions data by pollutant, source type (point, area, mobile), and geographic area. The Example Emissions Inventory Documentation report provides several examples of tables and graphics that can be presented for point, area, and mobile sources. At a minimum, the report needs to include summary emissions tables by pollutant and by source type; summary emissions tables by county; and graphics illustrating the contribution to areawide emissions by source type. States are required to report emissions data both on an annual and ozone/CO season daily/8-hour basis.

Separate discussions need to be presented to describe inventory development procedures and results for point, area (including off-highway mobile), and highway mobile sources. In addition to the specific parameters germane to point, area, and mobile source types, each source type discussion needs to explain how emissions were temporally allocated to a daily basis and how rule effectiveness was incorporated into each emission estimate.

The point source discussion needs to include a description of how the list of sources to be inventoried was identified. The discussion needs to address the issue of completeness of source coverage (i.e., how did you ensure that all 10 ton/yr sources were identified). Data collection methods and tools should be thoroughly explained and documented. All information surveys that may have been conducted need to be discussed and the results provided (probably in an appendix). All sources inventoried should be listed according to their source category type (e.g., refinery, graphic arts,

TABLE 1. OUTLINE FOR EPA RECOMMENDED FORMAT/CONTENTS FOR OZONE/CO SIP EMISSION INVENTORY REPORTS

I. Cover and Title Page

- A. Title (geographic area, type of inventories, pollutants, base year)
- B. Responsible agency [e.g., NC Dept of Health and Natural Resources]
- C. Report date (date completed/distributed)
- D. Preparer (if different from responsible agency - e.g., contractor)

II. Table of Contents

- A. Contents
- B. Tables
- C. Figures

III. Introduction

A. Reason for report being prepared, purpose

[For example, In response to letter from ____ to _____, dated _____ requesting preparation of a SIP for demonstration of attainment of ozone NAAQS in (geographic area), beginning with an emission inventory for base year 1990. Base year emission inventory serves as the basis for emissions modeling and projections for future years.]

B. Geographic area covered, base year, type of inventory (O_3 SIP, CO SIP), pollutants included (VOC, NO_x, CO)

C. Brief discussion of contents of report

[Note: Include a paragraph or less describing each major report section. For example, Section 2 summarizes stationary point, area and mobile source emissions by county. Section 3 describes stationary point source emissions and includes a discussion of methods used to gather data, calculate annual and seasonal emissions, and presents a summary of emissions by plant. Detailed point source emissions data are presented in Appendix F. Section 4 discusses...]

D. Discussion of automated data systems used (SAMS, AIR AFS, AMS-PC, State system)

E. Major problems, deficiencies, portions of inventory not included

F. List of primary guidance documents and references used (EPA guidance documents, AP-42, etc.)

G. List of contacts for each distinct portion of the inventory

IV. Summary

A. Emissions (annual and seasonal) of each pollutant by major category (point, area, mobile - broken down by nonhighway sources and highway vehicles; brief discussion in footnote, etc. to clarify what each includes - point sources above cutoff, area sources excluding nonhighway mobile sources?, nonhighway sources include aircraft, trains,...)

B. See example tables and graphics given in Example Emissions Inventory Documentation for Post-1987 Ozone State Implementation Plans (EPA-450/4-89-018).

V. Documentation of Emissions Methods/Data/Estimates*

A. Stationary Point Source Emissions*

1. discussions of procedures and methodologies
2. example surveys/questionnaires
3. list of plants by primary product and total emissions
4. detailed data for each plant (can put in appendix instead)
5. point source emissions summary

B. Stationary Area Source Emissions*

1. discussion of procedures and methodologies
2. list of source categories and emissions
3. calculations and discussion for each source category
4. area source emissions summary

C. Mobile Source Emissions

1. Non-highway Mobile Sources
   a. same information as for stationary area sources

2. Highway Vehicles
   a. mobile model inputs and outputs
   b. VMT estimates
   c. emission estimates
   d. documentation (can put all or part in Appendices)
   e. mobile source emissions summary
   f. discussion of procedures and methodologies

VI. Quality Assurance/Quality Checking (QA/QC)

A. QA/QC plan - discussion of QA/QC methodologies used

B. Results

C. QA procedures can also be discussed in individual source category sections

VII. Appendices

A. Lengthy data, calculations, documentation of methodologies/models

---

Notes: Both annual and seasonal emissions (O_3 - summertime daily emissions, CO - CO season 8-hour maximum emissions) should be presented in the summary and sections describing emissions.

All pages in the report (including appendices) should be numbered. Sources of information should be referenced throughout. Include complete list(s) of references within body of report (preferably at end of each section).

Margins of report should be adequate so that copying of report will not lose text, page numbers, or other important information.

- In addition to hard copy reporting requirements for emissions data, data must be reported in a computerized AIRS compatible format (Section 4.8). To the extent that data have been successfully loaded onto AIRS and reports can be generated from AIRS for nonattainment areas, this may alleviate transmittal of portions of the hard copy inventory that contain the detailed emissions data.

SOCMI plant, etc.). The methodology by which activity levels and emissions were determined for each plant or source category (when applicable) needs to be succinctly but explicitly explained. Large volumes of detailed data should be put into appendices but clearly linked to the text discussion in terms of how they were used to determine emissions. Summary tables and graphics should be prepared to address just point source emissions (e.g., summary table on VOC point source emissions ranked by source category type).

The area source discussion should cover stationary area sources, with off-highway mobile sources included in the mobile source discussion. The report needs to state if any source categories were not considered in the inventory and why. All of the source categories covered should be listed and the method used to determine emissions identified. If the EPA-recommended approach in the Procedures Document was used, but a different emission factor was used, this needs to be noted. For all approaches used (EPA or otherwise), the derivation of activity/commodity level data needs to be thoroughly discussed. As needed, supporting data can be put into appendices but the appendices have to be fully explained and clearly linkable back to the text discussion and emission estimates. Like point sources, emission summaries should be developed for area sources. The summaries need to reflect emissions by county and for the entire nonattainment area. Examples for these types of sources are found in the Example Emission Inventory Documentation report.

In the mobile sources section of the inventory report, States need to clearly describe how off-highway mobile emissions were calculated, how highway vehicle emission factors were determined, and how VMT estimates were determined. For highway vehicle emission factors, the States need to fully report how they used the updated MOBILE4 to help determine emissions. The values used for all input parameters required by the model should be presented and their basis discussed. The emission factors produced by the model should be presented by vehicle class. For VMT, the State needs to describe the methodology employed to generate VMT data, key

assumptions and inputs to the process, and the group responsible for the estimates. The VMT data determined should be presented by road type classification and by vehicle class. States need to explicitly describe the derivation of VMT. It is not acceptable to simply state that the Department of Transportation ran a transportation planning model and provided the air agency with VMT numbers. Simply providing a computer printout of a transportation modeling run, without any explanation, is also not acceptable. The agency that is responsible for the overall inventory must ensure that sufficient documentation is provided to fully explain how VMT and mobile source emission factors were derived.

The report needs to fully describe how the VMT data were combined with the emission factors to produce mobile source emission estimates. The calculated estimates need to be provided in summary form by vehicle class, by pollutant, and by county. Simple examples of how these summaries can be provided are given in the Example Emissions Inventory Documentation report referenced previously.

The inventory report needs to have a separate section that describes the implementation of the State's QA plan and the results achieved by the QA program. For all source category types, the QA discussion should address the completeness of the inventory (e.g., are all of the EPA-recommended area source categories accounted for), reasonableness of the emission estimates (e.g., are estimates for a category consistent with some other related parameter for the area), and relative accuracy of the data (e.g., do all of the individual county emission figures total to the sums given for the whole area). The QA discussion needs to show the range of quality review that was performed and how this review benefitted the inventory. The Emission Inventory Branch will be issuing additional quality review guidance in July 1991 to help States perform many of these quality checks and provide the kinds of QA feedback deemed necessary by EPA.

4.8 Computerized Data Management and Reporting

The Aerometric Information Retrieval System (AIRS) will be the official repository for the SIP emission inventory data. EPA will provide PC software packages for States to perform preliminary inventory preparation activities; **however, all SIP data must be successfully updated to AIRS before final approval of the SIP inventory is given. All SIP inventory data submitted to EPA must be in an AIRS-compatible format in order for it to be acceptable.** Point source data transfer from the SAMS PC package to the AIRS Facility Subsystem (AFS) will begin in January 1992. Area Source data transfer from the new area and mobile source PC package to the AIRS Area and Mobile Source Subsystem (AMS) will begin in May 1992. States' ability to use AFS and AMS directly for their submittals is discussed further below.

If States do not update SIP data directly to AIRS, EPA Regional Offices will perform the updates and provide the States with printed reports. States will review these reports and correct any errors before final EPA confirmation of inventory completeness is given.

States are advised to establish internal coordination to eliminate any conflict between submittals of their point source SIP data and their annual "NEDS" (for the former National Emissions Data System) data. NEDS point source data submittals are currently updated to AFS. The SIP data, when updated to AFS, will share some common data elements with the regular NEDS data previously submitted. Effective internal coordination by the States will assure that common 1990 data reported for specific sources to meet SIP and NEDS requirements are the same within the AFS data base.

A significant degree of quality assurance will be prevalent in point source and area source PC and mainframe software products. A wide range of data validation will be performed to ensure an appropriate response to inventory requirements and

EPA's ability to load States' data to AFS and AMS. Data validation, error correction and re-submittal procedures will be supplied to the States in the near future.

SIP data generated on PCs should be submitted to the appropriate RO contact. The ROs will perform the preliminary review of State submittals. Once the RO review is completed, SIP data will be further reviewed by the Emissions Inventory Branch (EIB) for completeness. The States might be contacted by EIB and the RO to perform some additional adjustments to their SIP data submittals. While the State submittals can be EPA certified as complete, data problems could arise when attempting to load SIP data to the national mainframe data bases. If this occurs, EIB, the RO, and the National Air Data Branch (NADB) will work with the States to resolve data problems.

NADB is responsible for the provision of AIRS and related software systems and procedures for States to prepare and submit their point source and area and mobile source inventories. Various submittal mechanisms will be available for the States to fulfill their inventory requirements. The information below addresses inventory data management issues for point, area, and mobile sources.

4.8.1 Point Source Inventory

States submitting point source inventories can choose one of four basic options to submit their data:

	Option	When Available
(1)	Current SAMS Version 3.1[1]	Now
(2)	SAMS Version 4.0[2]	March 28, 1991
(3)	AFS Batch Transaction Format Available[3]	May 17, 1991

(4) Interactive direct entry to AFS — December 31, 1991

NOTES:

(1) SAMS Version 3.1 (used for the Post-87 SIP inventories).

(2) SAMS Version 4.0 will include additional data elements (Stack-ID and Segment-ID) and edits to ensure compatibility with AFS. A later version of SAMS, Version 4.1, will include the capability to generate an AFS formatted transaction file (available mid-July 1991).

(3) This format must be used by States submitting data electronically from their own computer system directly to EPA's mainframe.

Option (1)

States could begin work to update their inventories to 1990 immediately after receiving this guidance document by using SAMS Version 3.1. However, prior to uploading to AFS, reconciliation of SAMS 3.1 data with the AFS data structure at the stack and segment levels of related SAMS/AFS facilities will be required. SAMS Version 4.0 will allow entering this additional information thereby reducing to a minimum the data conversion process from SAMS to AFS. Information relative to the required data elements for the inventory is also provided in this guidance document.

If you plan to use SAMS Version 3.1, please contact John Ackermann of NADB at (919) 541-5687 (FTS 629-5687) to discuss the data reconciliation process and issues.

Option (2)

SAMS Version 4.0 can be installed on a PC so that it can be used to update a SAMS data base prepared with an earlier version. By using the new data elements and AFS-edit routine in Version 4.0, the SAMS user can prepare 1990 SIP data

on SAMS (PC) that will be consistent with their State's files on AFS (mainframe). The Technical Support Division (TSD) will assist State and local agencies with data output from AFS, to update detailed point source data in SAMS. Then the SAMS data can be transferred to EPA's mainframe AFS data base with a minimum of corrections.

There will be a later release of SAMS Version 4.1, available in mid-July 1991. This newer version will provide a capability to generate AFS-acceptable transactions as an output from SAMS. The AFS-formatted transaction data from SAMS will be uploaded to the EPA IBM mainframe and then updated to AFS. TSD will review the submitted inventory prior to updating the AFS files. The updating of AFS will begin in January 1992.

Option (3)

States submitting an AFS formatted transaction file to EPA (format definitions will be provided in May 1991) can either mail a magnetic non-labeled tape or transmit a data set (if State has appropriate connectivity and technical resources) to the National Computer Center. Tape submitted data should be structured in IBM extended binary coded decimal interchange code (EBCDIC). The loading of the transaction files to AFS will begin in January 1992. Contact Jerry Husketh of NADB at (919) 541-5449 (FTS 629-5449) for more information.

Option (4)

In the long-term, the preferred option is to enter the SIP inventory point source data directly into AFS. However, this option will not be available to users until January 1992. Contact John Ackermann at (919) 541-5687 (FTS 629-5687) or Jerry Husketh at (919) 541-5449 (FTS 629-5449), Technical Support Division, if you plan to use this approach.

Point Source Data Elements

Applicable data elements that will be supported by AFS are as follows. Data elements required for the O_3/CO SIP inventories are shaded. These data elements will be more explicitly defined in the O_3/CO SIP Inventory Requirements Document guidance to be issued in March 1991.

List of Data Elements for Plant General Level:

Description

****FIPS state code**
****FIPS county code**
***year of record for emissions**
****plant ID from AFS (or NEDS)**
***plant name**
***street address**
***city name[1]**
***zip code**
local plant ID
***FIPS city code[1]**
***plant latitude[2]**
***plant longitude[2]**
***UTM zone[2]**
***UTM easting[2]**
***UTM northing[2]**
township/modeling grid
***primary SIC code**
secondary SIC code
tertiary SIC code
principal product
number of employees
plant area
plant contact
contact telephone number
type of inventory
plant comment

Required for O_3/CO SIP emission inventories.

* Mandatory for AFS format, for Adds.
** Mandatory for both Adds and Changes to AFS.

[1]Note for city: enter data for either city name or for FIPS city code, but not both.

[2]Note for plant location: enter data for either lat/long or UTM, but not both.

List of Data Elements for Point General Level:

Description
****FIPS state code**
****FIPS county code**
****plant ID from AFS (or NEDS)**
****point ID from AFS**
local point ID
hours per day
days per week
hours operated per year
start time (each workday)
end time (each workday)
percent throughput - Dec. thru Feb.
percent throughput - March thru May
percent throughput - June thru Aug.
percent throughput - Sept. thru Nov.
boiler capacity
space heat percentage
point comment

Required for O_3/CO SIP emission inventories.

** Mandatory for both Adds and Changes to AFS.

List of Data Elements for Point Pollutant Level:

Description
**FIPS state code
**FIPS county code
**plant ID from AFS (or NEDS)
**point ID from AFS
**pollutant code or CAS code
measured emissions at point
emission measurement method code
measured emissions units
SIP regulation in place for point
compliance year for point
emission limitation for point
emission limitation value
emission limitation units

** Mandatory for both Adds and Changes to AFS.

List of Data Elements for Stack Level:

Description
**FIPS state code
**FIPS county code
**plant ID from AFS (or NEDS)
**stack ID from AFS
*stack height (ft)[1,3]
*stack diameter (ft)[1,3]
*plume height (vent height, ft)[1,3]
latitude for stack[2,3]
longitude for stack[2,3]
UTM easting for stack[2,3]
UTM northing for stack[2,3]
temperature of exit gases (F)
exhaust gas flow rate (ACFM)
exit gas velocity (ft/sec)

* Required for O_3/CO SIP emission inventories.

* Mandatory for AFS format, for Adds.

** Mandatory for both Adds and Changes to AFS.

[1]Note: required either to enter stack height and stack diameter or to enter plume height (vent height).

[2]Note: for Stack location (if different from Plant), enter either lat/long or UTM, but not both.

[3]Note: required for AFS only if a stack exists and stack ID has been entered; for SIP inventories, this parameter is not required if no stack exists or if photochemical modeling is not required for an attainment demonstration.

List of Data Elements for Segment General Level:

Description

**FIPS state code
**FIPS county code
**plant ID from AFS (or NEDS)
**point ID from AFS
**segment ID from AFS
*SCC number
sulfur percentage
ash percentage
heat content
confidentiality
process rate units
actual annual process rate[2]
maximum design rate[2]
O_3 season process rate (daily)[2]
CO season process rate (8 hr.)[2]
stack ID related to this segment[1]
segment comment

Required for O_3/CO SIP emission inventories.

* Mandatory for AFS format, for Adds.

** Mandatory for both Adds and Changes to AFS.

[1]Note: required for AFS only if a stack exists; for SIP inventories, this parameter is not required if no stack exists or if photochemical modeling is not required for attainment demonstration.

[2]Note: these parameters must be provided unless they are deemed to be confidential or their reporting is prohibited by State law.

List of Data Elements for Segment Pollutant Level:

Description

**FIPS state code
**FIPS county code
**plant ID from AFS (or NEDS)
**point ID from AFS
**segment ID from AFS
**pollutant code or CAS code
primary control device code[1]
secondary control device code[1]
control efficiency[1]
SIP regulation in place for segment
compliance year for segment
emission limitation description for segment
emission limitation value
emission limitation units
emission estimation method
emission factor[2]
seasonal adjustment factor
annual nonbanked emissions (estimated actual)
annual banked emissions
rule effectiveness[3]
O_3 season emissions (lb/day)
CO season emissions (lb/8 hr.)

Required for O_3/CO SIP emission inventories.

** Mandatory for both Adds and Changes to AFS.

[1]Note: required for SIP inventories only when a control device exists.

[2]Note: required for SIP inventories only when the emission estimation method code indicates that an emission factor was used (i.e., method codes 3 and 5 for SAMS reporting or method code 9 for AFS batch format reporting). For other method codes, an emission factor does not apply and is not required.

[3]Note: required for SIP inventories only when rule is in place that affects emissions of the pollutant.

4.8.2 Area and Mobile Source Inventory

The National Air Data Branch is developing a new AIRS subsystem to handle the area and mobile source inventories. The new mainframe software is called AIRS Area and Mobile Source Subsystem (AMS) and will facilitate State data entry, update, and access to area source data. Since AMS will not be able to upload State data in formatted transactions until May 1992 (AMS "National" capability by November 1992), AMS data entry software is being developed on a personal computer (PC).

States have three basic options to submit their area source data. However, please note that option 3 will not be available in time for the draft area and mobile source inventory submittals but could be used for final base year submittals or periodic inventory updates.

Option	When Available
(1) AMS-PC Version 1.0	June 28, 1991
(2) AMS Batch Transaction Format Available	July 31, 1991
(3) AMS Mainframe Interactive Direct Entry	May 29, 1992

Option (1)

The AMS-PC package will be available to the States by June 28, 1991. States may use the AMS-PC package to submit their 1990 base-year inventory for area and mobile sources. The AMS-PC Version 1.0 will be a basic data-entry system for State-prepared emissions values, and will have only minimal calculation capabilities. The AMS-PC package will be compatible with the mainframe AIRS AMS in categories, codes, and edits, and will be consistent with EPA's guidance for SIP 1990 base-year inventories. Note that SAMS Version 4.0 and Version 4.1 will not provide the appropriate categories and formats to develop the 1990 area source or mobile source inventory; therefore, SAMS cannot be used for the purpose of submitting AMS inventory data.

Option (2)

States planning to transmit a computer generated data set or magnetic tape file will need to supply data in EPA's AMS batch transaction format. This format will be defined and distributed to the States in July 1991. Tape submitted data should be structured in IBM EBCDIC.

AMS transactions generated from the AMS-PC and AMS batch transactions generated and submitted from State computers will be updated to the AMS mainframe data base. The capability to update this SIP data to the mainframe is scheduled for May 1992. During the period of January through May, 1992, the Technical Support Division will provide assistance with basic edits and review of draft inventories submitted as AMS batch transactions from State computers. The Regions and the States will receive additional information and guidance regarding area and mobile source procedures in the near future. State personnel should contact John Ackermann or Sue Kimbrough of NADB to indicate what type of approach will be used for their area and mobile source inventories.

Option (3)

The AMS mainframe data entry capability for area and mobile source data will be available in May 1992. States will be able to do corrections, updates or projections interactively to base year data existing or imported into AMS. States planning to use this approach will need AMS training and should coordinate their submittal plan with Sue Kimbrough of NADB, at (919) 541-5457 (FTS 629-5457).

4.8.3 Format for Area and Mobile Source Data

Previously, the SIP guidance documents and the SAMS system provided for a series of source categories that ranged from the detailed level to a very aggregated level. However, the source category codes developed for use within AMS have been designed to encourage the user to submit data at a more detailed level. Therefore, the AMS source categories are significantly different from the manner in which source categories have been designated in past SIP guidance. These source category codes and descriptions will be listed in the more detailed guidance documents that will be issued over the next few months.

4.9 Statewide Point Source Emission Inventories for Regional Modeling

EPA plans to perform regional scale photochemical modeling for domains covering the Eastern U.S., east of longitude 99 degrees W to provide States with a number of critical data bases for use in urban scale modeling required for SIP demonstrations in certain nonattainment areas (see Section 2.2.1). Estimates of future-year air quality concentrations will be provided for use in specifying urban scale boundary conditions (i.e., incoming transported concentrations) and initial conditions. Additional meteorological and geographic data bases available from the regional modeling applications will also be provided to the States by EPA. The future-year concentration estimates quantify the effects of projected growth, Federal/subregional

control programs (e.g. FMVCP and alternate fuels), and local control measures in upwind areas.

For consistency with urban scale modeling, 1990 emissions are needed for the base case regional inventory. States in EPA Regions I through VII are requested to develop the point source emissions needed for this inventory. This consists of a statewide 1990 point source inventory for VOC, NO_x, and CO for facilities that emit greater than or equal to 100 tons per year. This inventory is essentially the same as traditionally required for an annual "NEDS" submittal (this submittal is now being handled through the AIRS-AFS). Data elements required to be reported with this inventory are identified in Section 4.8. These statewide inventories should be prepared in a manner consistent with those developed for nonattainment areas. Guidance documents and schedules for planning, developing, quality assuring, and submitting point source inventories are identified in Sections 3.4, 3.10, 3.11.1, and 4.1.

5.0 PLANNED MILESTONES AND SCHEDULES

This section presents a discussion and graphical illustration of the milestones and planned EPA schedules connected with Title I of the CAAA generally and with emission inventories specifically. The two-fold purpose of the discussion is to provide a description of the guidance, training, and inventory activities that will be taking place with States and EPA under Title I between CAAA enactment and 1994, and to provide a listing of the different inventory milestones that exist for varying classifications of nonattainment areas.

Figure 1 depicts EPA's overall schedule for the implementation of Title I ozone and CO inventory activities. The schedule illustrates when the base year inventory milestones occur, when EPA guidance materials are to be issued, and when training sessions with the States are to be held. **The highlights of the timeline are summarized as follows.**

Item	Planned Date
States initiate base year inventory data collection	**February 1991**
States initiate inventory preparation plan development	**February 1991**
O_3 and CO SIP inventory requirements documents issued	**March 1991**
Photochemical modeling inventory guidance issued	**May 1991**

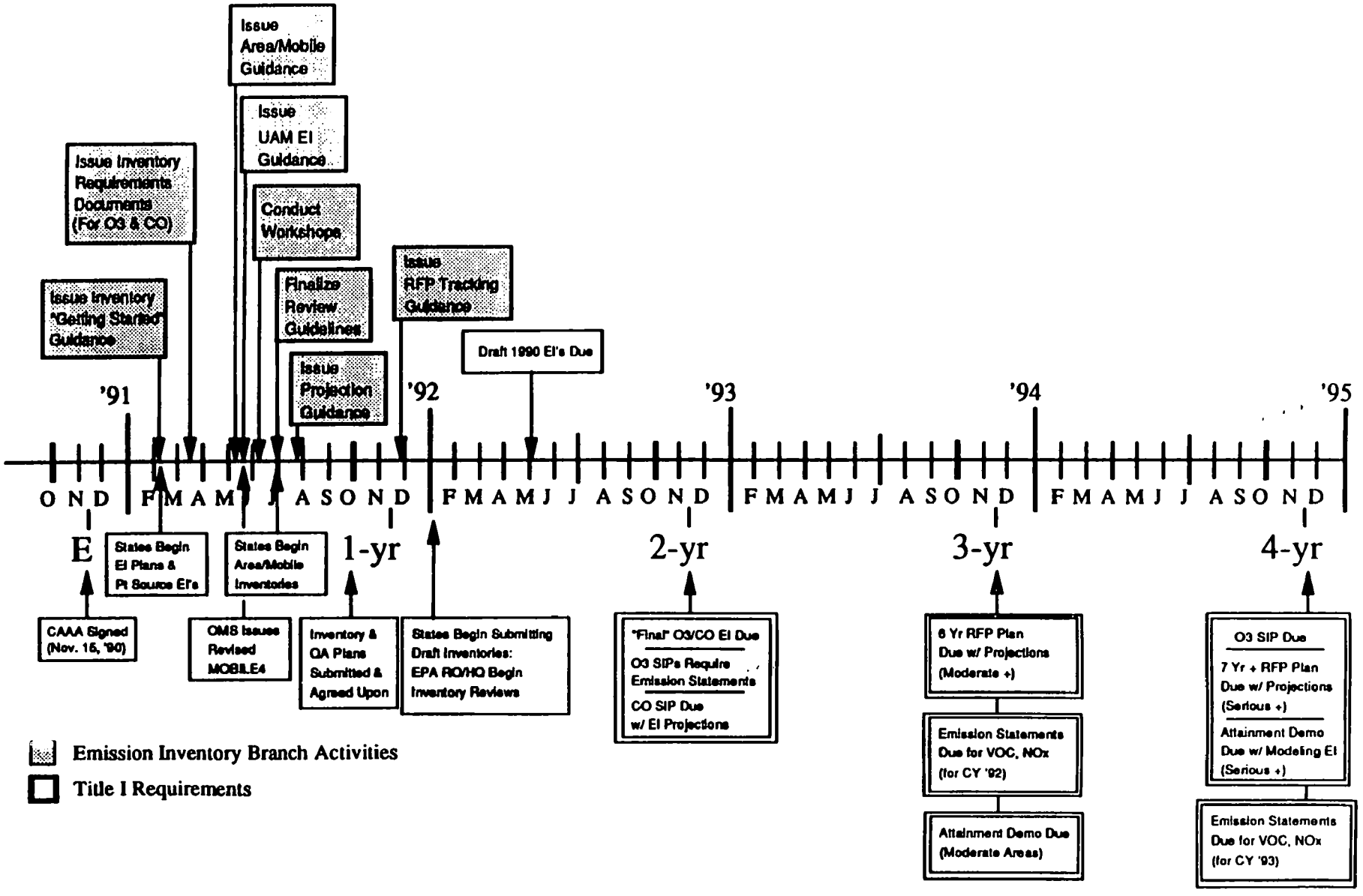

Figure 1. Title I Ozone/CO Emission Inventory Timeline

New area/mobile source guidance issued	May 1991
Updated MOBILE4 model issued	May 1991
Conduct training workshops with States	June 1991
States finalize inventory preparation plans and submit to EPA for review	March-June 1991
Quality review guidelines issued	July 1991
Projection guidance issued	July 1991
Inventory preparation and QA plans finalized and approved by EPA	October 1991
RFP tracking guidance issued	November 1991
Draft 1990 base year inventories submitted to EPA for review	January-May 1992
EPA provides comments to States on draft inventories	April-August 1992
States submit final inventories	November 15, 1992

EPA expects States to generally initiate 1990 base year inventory preparation activities in February 1991 even though not all necessary guidance materials will be available at this time. Since the majority of the emissions estimating guidance for point sources remains unchanged from the previous Post-1987 Policy, there are numerous data collection activities that States can begin. As a part of these initial efforts States should begin thinking about how they plan to present their inventory preparation plan and their QA plan. As the guidance and training schedule under the CAAA proceeds, these plans should become more and more concrete. **States need to keep in mind that they have to submit and gain approval of an inventory preparation plan as an initial step in the inventory compilation.** The sooner this plan is developed and submitted for approval, the sooner States can proceed with full inventory preparation activities. As

discussed in Section 3.10 on QA, States need to include with the inventory plan a QA plan component or submit a separate QA plan in conjunction with the inventory plan. The dates shown in Figure 1 for these types of activities should be viewed as upper limits not to be exceeded. EPA encourages States to complete all of the specified milestones as soon as they are able, as this will provide more time for addressing comments and revisions and for subsequent activities such as RFP planning and modeling.

Draft 1990 base year emission inventories must be submitted prior to May 1, 1992 to ensure that adequate time is available for review and revision of inventories by November 15, 1992, the required date for final inventory submittal. Allowing this extra review time will help ensure that the final inventories are complete, comprehensive, and meet all EPA specifications. States are encouraged to submit draft inventories as early as January 1, 1992, particularly for draft point source inventories. States must consult and coordinate inventory submittal schedules with their respective Regional Offices to ensure that all inventory components are prepared and delivered in accordance with these dates.

EPA will review the submitted inventories and provide comments back to the States within three months. States then need to address the EPA comments and provide final inventories to EPA by November 15, 1992, the date required by the CAAA. EPA anticipates that the respective Regional Offices will take the lead on performing detailed inventory review. EPA headquarters will provide more of an oversight function to ensure consistency among the Regions. **All inventory submittals (draft and final versions) should be copied to EPA headquarters (OAQPS) at the same time they are sent to the Regional Offices. The total inventory package should be sent to OAQPS to the attention of: Chief, Inventory Guidance and Evaluation Section, Emission Inventory Branch (MD-14), Technical Support Division, U. S. Environmental Protection Agency, Research Triangle Park, N.C., 27711. Portions of the inventories dealing with mobile source emissions should be directed to Ms. Jane Armstrong of the Office of Mobile Sources, Test and Evaluation Branch (TEB-13), U. S. Environmental Protection Agency,**

2565 Plymouth Road, Ann Arbor, Michigan, 48105. In addition to specific inventory materials of any type, States should also copy EPA headquarters on all correspondence pertaining to their inventories such as comment letters, modifications to their IPP or QA plan, etc.

6.0 ADDITIONAL GUIDANCE TO BE ISSUED BY EPA

The purpose of this section is to identify and describe the contents of additional guidance materials EPA plans on releasing in 1991 to respond to the inventory requirements of the CAAA. This guidance will take the form of both hard copy reports and memos and training workshops with the State and local agencies responsible for developing inventories. Most of these additional guidance materials will be issued in the spring and no later than the summer of 1991. Regardless, States should begin thinking about the issues to be covered in the additional guidance materials and begin formulating ways to address the basic informational needs. For example, even though formal projections guidance is not scheduled for release until July, States can certainly be thinking of ways they can address this issue with their point, area, and mobile sources (i.e., what data need to be gathered, what data are available for my sources, how can these best be gathered, etc.).

Soon after the distribution of this initial CAAA inventory guidance, EPA will be providing States with new inventory "Requirements Documents" that will be very similar in form and content to the similar documents issued under the proposed Post-1987 Policy [Emission Inventory Requirements for Post-1987 Ozone State Implementation Plans (EPA 450/4-88-019) and Emission Inventory Requirements for Post-1987 Carbon Monoxide State Implementation Plans (EPA 450/4-88-020)]. The new Requirements Documents will reflect in detail the inventory requirements States are facing under the CAAA in terms of both direct statutory requirements and EPA policy requirements formulated in response to the new Act. In effect the documents will provide more detail on many of the points preliminarily raised in this discussion. The information in the documents will focus on the base year inventory requirements and will generally not be subject to change. **Two new Requirements Documents will be issued, one for ozone inventories and one for CO. EPA plans to distribute these documents to States in March 1991.**

The second type of guidance EPA will be issuing concerns the development of emission inventories for use in urban airshed modeling (UAM). **In May 1991, EPA will provide States with guidance on how inventories need to be prepared in order to support photochemical air quality modeling.** The guidance will address needs relating to chemical speciation, temporal allocations, and spatial allocations. The relationships between the modeling inventory or inventories and the base year inventory will be explained. The guidance will point out how and when the base year inventory can be used to support the preparation of the base year modeling inventory. EPA will be releasing a significant amount of UAM use and application guidance in May/June 1991 that will also help communicate the role of modeling inventories and how they need to be compiled.

As discussed in Section 3.0, EPA operates an internal work group known as the JEIOG (Joint Emission Inventory Oversight Group) which is conducting a series of research projects on developing new methodologies for emission inventory preparation. The JEIOG projects to date have focused primarily on evaporative solvent loss area sources, previously unidentified sources, off-highway mobiles sources, and highway mobile sources. The projects are designed to study the methods and data currently available to conduct micro and macro scale emission inventories and research ways to improve/replace the current methodologies. These improvements may take the form of new emission factors, new calculational procedures, and new information sources/data bases. **In May 1991, EPA will release the first guidance product of the JEIOG effort. The May guidance will be concentrated on area sources such as miscellaneous solvent uses, previously uninventoried sources, off-highway mobile sources such as trains and airplanes, and highway mobile issues like VMT development.** Inventory preparation guidance produced by the JEIOG projects will supersede that contained in the previously released Procedures Documents (EPA 450/4-88-021 and EPA 450/4-81-026d, revised). Since the JEIOG is an ongoing activity, more revisions to previously issued inventory preparation guidance for area and mobile sources are likely in the form of technical memoranda to States. However, the impact of such new guidance on the SIP inventory

process will be evaluated by EPA as it becomes available and will depend on the significance to the overall inventory (see Backcasting, Section 4.4).

In May 1991, EPA will release a new version of its mobile source emission factor model. The new version will replace the current and previously required version of MOBILE4. For 1990 base year emission inventories under the CAAA, EPA is requiring that States, with the exception of California, use the updated model version to determine highway mobile source emissions. The changes in MOBILE4 are relatively minor in terms of how they will affect a State trying to use the new model. Most of the improvements are internal to the model such that the requirements on a State using the model are not really any different or more significant than they were for the previous MOBILE4 version. A new MOBILE4 User's Guide will be issued that details all changes and assists users with clear step-by-step instructions on model execution. Since EPA is requiring that all nonattainment areas prepare new 1990 mobile source inventories, the added requirement to incorporate the updated MOBILE4 model should not present a significant or undue burden on any State.

As discussed in Section 3.9, the projection of emissions to future years is still an important inventory function under the CAAA. There are several requirements for projected emission inventories. **For this reason, EPA is developing formal, detailed guidance for States to use in preparing emissions projections. The guidance is slated for distribution in July 1991.** The guidance will address the performance of projections for stationary point and area, off-highway mobile, and highway mobile sources. Whenever possible, EPA encourages States to use site-specific and source-specific data in calculating projected emissions. In cases where such data are not easily available, EPA guidance will provide States with alternative approaches and sources of data to implement the approaches. Any source surveys States are planning on conducting to gather data for the 1990 base year inventory should include questions regarding source growth and expected changes in factors that affect emissions.

In May 1991, EPA will also be providing guidance on one of the new requirements of the CAAA, Emissions Statements. The basic requirements of Emissions Statements are described in Section 4.3. At this time, EPA is still formulating the precise form and content it wants Emissions Statements to take. Since all States with ozone nonattainment areas are required to compile Emissions Statements, EPA wants the statements to be developed in a standard and consistent manner to better facilitate EPA review and to maximize their potential use in other activities such as emissions tracking. The guidance will address the temporal basis for the estimates (annual, daily, hourly, other, etc.), the specificity of the estimates (total plant, each emission point, each process unit, etc.), the level of documentation required for the statement, and the required reporting format (written and computerized).

In July 1991, EPA is planning on providing States with guidance material that will be helpful not only in checking the compiled inventory prior to submission to EPA, but also in designing how to begin preparation of the overall effort. This guidance will take the form of quality review guidelines. The quality review guidelines will allow States to check whether or not they followed the requirements for inventory preparation issued by EPA and whether their inventories meet the specifications developed for completeness, consistency (both internal and national), reasonableness of emission values, and overall documentation requirements. The guidelines will be beneficial to States in designing and conducting their inventory QA program. Once finalized, the review guidelines will serve to supersede the quality review checklist given in Appendix B of the previously published Requirements Documents. The guidelines will also present EPA Regional offices with a standard set of guidelines to use in conducting formal reviews of ozone and CO SIP inventories.

As was done in connection with the proposed Post-1987 Policy, EPA plans to conduct regional workshops with State and local agencies to present and discuss all relevant CAAA emission inventory issues and requirements identified in this document. These workshops are currently projected for late Spring-early Summer of 1991. EPA

hopes to have most of the planned guidance in States' hands before the workshops begin, but it is likely that not all materials will be available before the workshop discussions. Although the form and agendas for the workshops have not yet been set, it is likely that they will be multiday events at which the participants will have a significant opportunity for questions and interaction with appropriate EPA Regional Office and Headquarters personnel. The dates and locations for the workshops will be communicated as soon as they are determined.

Guidance documents that are planned or under development are listed below along with an expected date of release.

1. Requirements for O_3 and CO SIP emission inventories. March 1991.

2. Revision of Procedures for the Preparation of Emission Inventories for Precursors of Ozone, EPA 450/4-88-021. May 1991.

3. Revised guidance for mobile source emission inventories including vehicle miles travelled. May 1991.

4. Guidance on preparing emission inventories for photochemical grid modeling. May 1991.

5. Finalize inventory review guidelines. July 1991.

6. Emission inventory projection guidance. July 1991.

7. RFP tracking guidance. November 1991.

7.0 EXISTING EPA GUIDANCE FOR OZONE/CO EMISSION INVENTORIES

The purpose of this section is to identify and provide bibliographic citations of currently existing EPA guidance materials for the development of ozone/CO SIP emission inventories. The list of existing guidance is divided into four categories: ozone/CO SIP inventory guidance/requirements, quality assurance/inventory review guidance, emission factors/models, and general inventory guidance. If updates to an existing document are planned in response to the CAAA, this is indicated in the guidance citation.

Ozone/CO SIP Inventory Guidance/Requirements

1. Procedures For The Preparation Of Emission Inventories For Precursors Of Ozone, Volume I, EPA-450/4-88-021, Third Edition, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, December 1988. [Revised version to be completed in May 1991.]

2. Procedures For The Preparation Of Emission Inventories For Volatile Organic Compounds, Volume II: Emission Inventory Requirements For Photochemical Air Quality Simulation Models, EPA-450/4-79-018, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, September 1979. [Revised version to be completed in May 1991.]

3. Procedures For Emission Inventory Preparation, Volume IV: Mobile Sources, EPA-450/4-81-026d, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle, Park, NC, July 1989 (also listed below under General Inventory Guidance). [Revised version to be completed in May 1991.]

4. Emission Inventory Requirements For Post-1987 Ozone State Implementation Plans, EPA-450/4-88-019, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, December 1988. [Revised version to be completed in March 1991.]

5. Emission Inventory Requirements for Post-1987 Carbon Monoxide State Implementation Plans, EPA-450/4-88-020, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, December 1988. [Revised version to be completed in March 1991.]

6. Example Emission Inventory Documentation For Post-1987 Ozone State Implementation Plans (SIPs), EPA-450/4-89-018, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, October 1989.

7. Procedures For Estimating And Applying Rule Effectiveness In Post-1987 Base Year Emission Inventories For Ozone And Carbon Monoxide State Implementation Plans, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, June 1989.

8. SIP Air Pollutant Inventory Management System (SAMS) Version 3.1 and SAMS User's Manual, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, April 1990. [Revised version to be completed in March 1991.]

Quality Assurance/Inventory Review Guidance

9. Guidance For The Preparation Of Quality Assurance Plans For O_3/CO SIP Emission Inventories, EPA-450/4-88-023, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, December 1988.

10. Quality Assurance Program For Post-1987 Ozone And Carbon Monoxide State Implementation Plan Emission Inventories, EPA-450/4-89-004, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, March 1989.

11. Quality Review Guidelines For Post-1987 State Implementation Plan (SIP) Base Year Emission Inventories (Draft), U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, February 1990. [Final version to be completed in July 1991.]

12. Guidelines For Review Of Highway Source Emission Inventories For 1982 State Implementation Plans, EPA-450/12-80-002, U. S. Environmental Protection Agency, Research Triangle Park, NC, December 1980. [This document will be superseded by the Quality Review Guidelines document above, to be completed in July 1991.]

General Inventory Guidance

13. Procedures For Emission Inventory Preparation, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle, Park, NC:

    a. Volume I: Emission Inventory Fundamentals, EPA-450/4-81-026a, September 1981.

    b. Volume II: Point Sources, EPA-450/4-81-026b, September 1981.

    c. Volume III: Area Sources, EPA-450/4-81-026c, September 1981.

    d. Volume IV: Mobile Sources, EPA-450/4-81-026d (Revised), July 1989. [Updated version to be completed in May 1991.]

    e. Volume V: Bibliography, EPA-450/4-81-026e, September 1981.

Emission Factors/Models

14. Compilation of Air Pollutant Emission Factors, Volumes I and II and its supplements, Fourth Edition, AP-42, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, September 1985.

15. AIRS Facility Subsystem Source Classification Codes (SCCs) And Emission Factor Listing For Criteria Pollutants, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, September 1989.

16. User's Guide to MOBILE4 (Mobile Source Emission Factor Model), EPA-AA-TEB-89-01, U. S. Environmental Protection Agency, Office of Mobile Sources, Ann Arbor, MI, February 1989. [Revised version of MOBILE4 and documentation to be completed in May 1991.]

17. Surface Impoundment Modeling System (SIMS) Version 2.0 User's Manual, EPA-450/4-90-019a, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1990.

18. Background Document For Surface Impoundment Modeling System (SIMS) Version 2.0, EPA-450/4-90-019b, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1990.

To obtain copies of any of these documents, contact Mary Ann Stewart at (919) 541-4340 or FTS 629-4340.