



## Project Summary

# Quality Assurance and Quality Control Plan for the NAPAP 1985 Emission Inventory

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The National Acid Precipitation Assessment Program (NAPAP) was established by Congress in 1980 to coordinate and expand research on problems posed by acid deposition in and around the United States. One fundamental objective of NAPAP's research program is the location and quantification of natural and anthropogenic emissions that may contribute to acid deposition.

To achieve this objective, NAPAP's Task Group on Emissions and Controls is conducting a multi-year research effort to develop an accurate and comprehensive inventory of 1985 emissions thought to be important in acid deposition processes. Most of the 1985 emissions inventory data for this inventory are being collected and analyzed by state air pollution control agencies and the United States Environmental Protection Agency.

This report has been developed to identify quality assurance (QA) and quality control (QC) objectives that must be met to create a comprehensive and accurate inventory. The report reviews data quality objectives, priorities, and constraints for the collection of the 1985 inventory data. The responsibilities of the inventory participants are delineated and presented chronologically in a workplan. QA and QC checks of both inventory data and the allocation factors used to resolve the data spatially, temporally, and by pollutant species are discussed. Guidelines for data processing, documentation, and the calculation of data quality indicators are reviewed.

*This Project Summary was developed by EPA's Air and Energy Engineering Re-*

*search Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).*

### Introduction

The "Acid Precipitation Act of 1980" (Title VII of P.L. 96-294) established a long-term interagency program to coordinate and expand research on problems posed by acid deposition in and around the United States. Among the priority research objectives that Congress identified for this National Acid Precipitation Assessment Program (NAPAP) was the development of a nationwide emissions inventory of sources that may contribute to the formation of acid precipitation. This report has been developed to identify the specific QA/QC objectives that must be met to create a comprehensive and accurate 1985 emissions inventory.

The report is divided into eight sections, each of which is described briefly in the following paragraphs.

1. *Project objectives and constraints.*

This section includes a general description of the emission inventory objectives, constraints (i.e., schedule and resources), and principal intermediate and final work products that will be developed to meet the project objectives. The emission inventory objectives are presented in Table 1.

2. *Project organization.* This section describes the participating agencies in the inventory and QA/QC activities, the line of authority for the in-

**Table 1. NAPAP Emissions Inventory Data Quality Objectives**

	<i>Emissions Inventory for Support of Assessment Activities</i>	<i>Emissions Inventory for Support of Eulerian Atmospheric Modeling</i>
<i>Geographic Domain</i>	<i>48 U.S. States, Canada, and Northern Mexico</i>	<i>48 U.S. States, Canada, and Northern Mexico</i>
<i>Temporal Resolution</i>	<i>Annual/seasonal</i>	<i>Hourly emissions values for typical weekday, Saturday, and Sunday for all four seasons</i>
<i>Spatial Resolution</i>	<i>Coordinates for point sources; area sources at the county level in the U.S. and at the province level in Canada; natural sources at county, state, or province level; release height</i>	<i>Coordinates for point sources; area sources assigned to 20 x 20 km grid cells; release height</i>
<i>Species</i>	<i>SO<sub>2</sub>, NO<sub>x</sub>, reactive VOC</i>	<i>SO<sub>2</sub>, SO<sub>4</sub>, TSP (Ca, Mg, K, Na), Pb, CO, HC1, HF, NO, NO<sub>2</sub>, NH<sub>3</sub>, VOC (methane, ethane, ethylene, propane, propylene, N-butane, 1,2-butane, isobutane, isobutene, trans-2 butene, pentane, isopentane, 2,3-dimethylbutane, other alkenes, other alkanes, formic acid, acetic acid, other organic acids, formaldehyde, acetaldehyde, propionaldehyde, acetone, other ketones, other aldehydes, xylene, benzene, toluene, ethylbenzene, other aromatics), natural emissions (S, alkaline dust, NO<sub>x</sub> from lightning and biota, isoprene, 4 major turpines, NH<sub>3</sub>)</i>
<i>Sources</i>	<i>Anthropogenic stationary sources emitting &gt;100 tons of criteria pollutants in 1985; area source estimates for small stationary and mobile sources; natural sources</i>	<i>Anthropogenic stationary sources emitting &gt;100 tons of criteria pollutants in 1985; area source estimates for small stationary and mobile sources; natural sources</i>

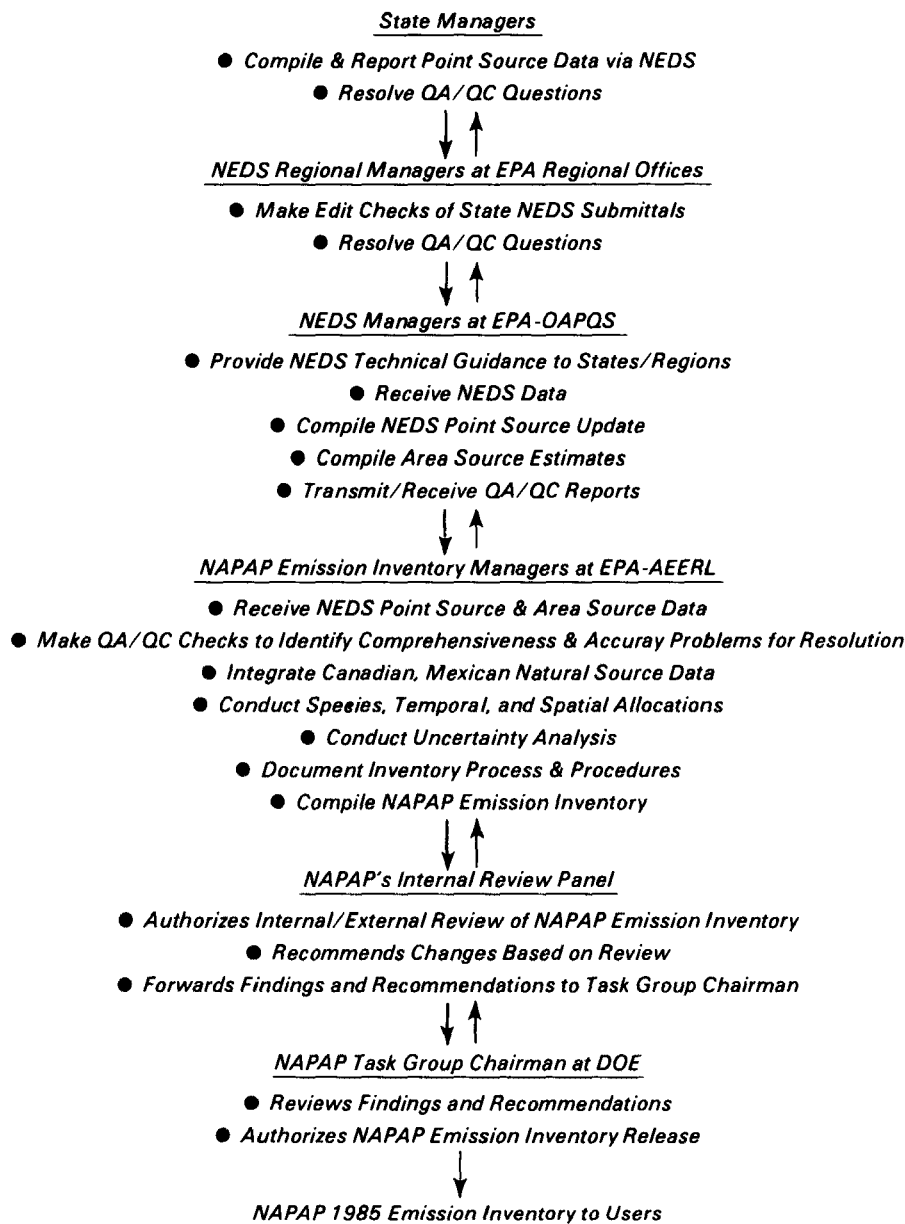
ventory project, and a general description of the responsibilities of each participant. Figure 1 shows the project organization for the 1985 inventory. A workplan describing the inventory schedule and detailing intermediate workproducts is included.

3. *Data collection and QA/QC procedures.* This section reviews the procedures used by the inventory participants to collect, check, and process inventory data. Documents and work-shops for inventory participants communicating standardized collection and calculation procedures are discussed and referenced.
4. *Data custody.* This section details the handling of the data from the beginning of the project when individuals obtain data through completion of the project when the final inventory tapes are completed.
5. *Data validation and QA/QC checks.* This section discusses the procedures used to validate the computerized data reported for the point and area sources in the inventory. The procedures include emissions confirmation status, comprehensiveness of the source data in terms of both missing sources and double counted

sources, and the representativeness of the data for the reference year of the inventory project. Procedures for making QA/QC checks for invalid data and for identifying data items which have been encoded properly, but which are not appropriate for the emission source (e.g., a stack height which exceeds the tallest known stack constructed for that type of source), are discussed.

6. *Internal data handling procedures.* This section details procedures for generating emission factors used to calculate source emissions and to resolve the inventory data temporally, spatially, and by pollutant species. The section also discusses plans for testing newly developed software modules used to perform QA/QC checks, computer system updates, spatial/temporal/speciation allocations, and other routine inventory data processing activities. Additionally, procedures followed to flag data identified as questionable, establish audit trails, and resolve the question or substitute default values for the original data are discussed. Finally, plans to develop and maintain a library to store copies of intermediate data, final inventories, and supporting software are discussed.

7. *Calculation of data quality indicators.* This section details the procedures for determining the accuracy or uncertainty of the final inventory.
8. *Plans for QA/QC reports and corrective action.* This section describes plans to develop QA/QC reports and to review and resolve QA/QC questions and problems that have been identified with the inventory data or inventory methodologies (e.g., problems with area source estimation methodologies).



**Figure 1.** Interactions in NAPAP 1985 emissions inventory.

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The complete report, entitled "Quality Assurance and Quality Control Plan for the NAPAP 1985 Emission Inventory," (Order No. PB 86-237 682/AS; Cost: \$9.95, subject to change) will be available only from:

National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
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