
BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Problems In Air Quality Monitoring System Affect Data Reliability

The Environmental Protection Agency (EPA), which is responsible for directing the Nation's efforts to improve air quality, makes numerous decisions affecting the Nation's health and economic welfare. EPA has established a national air quality monitoring system to collect the data used as a basis for these decisions. Problems in this monitoring system raise questions about the reliability of air quality data.

EPA actions to resolve these problems have been slow and costly. In this report GAO recommends several actions EPA and the Congress can take to correct the situation.



119491

GAO/CED-82-101
SEPTEMBER 22, 1982

023421

Request for copies of GAO reports should be sent to:

**U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760**

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are \$3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are \$1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-206212

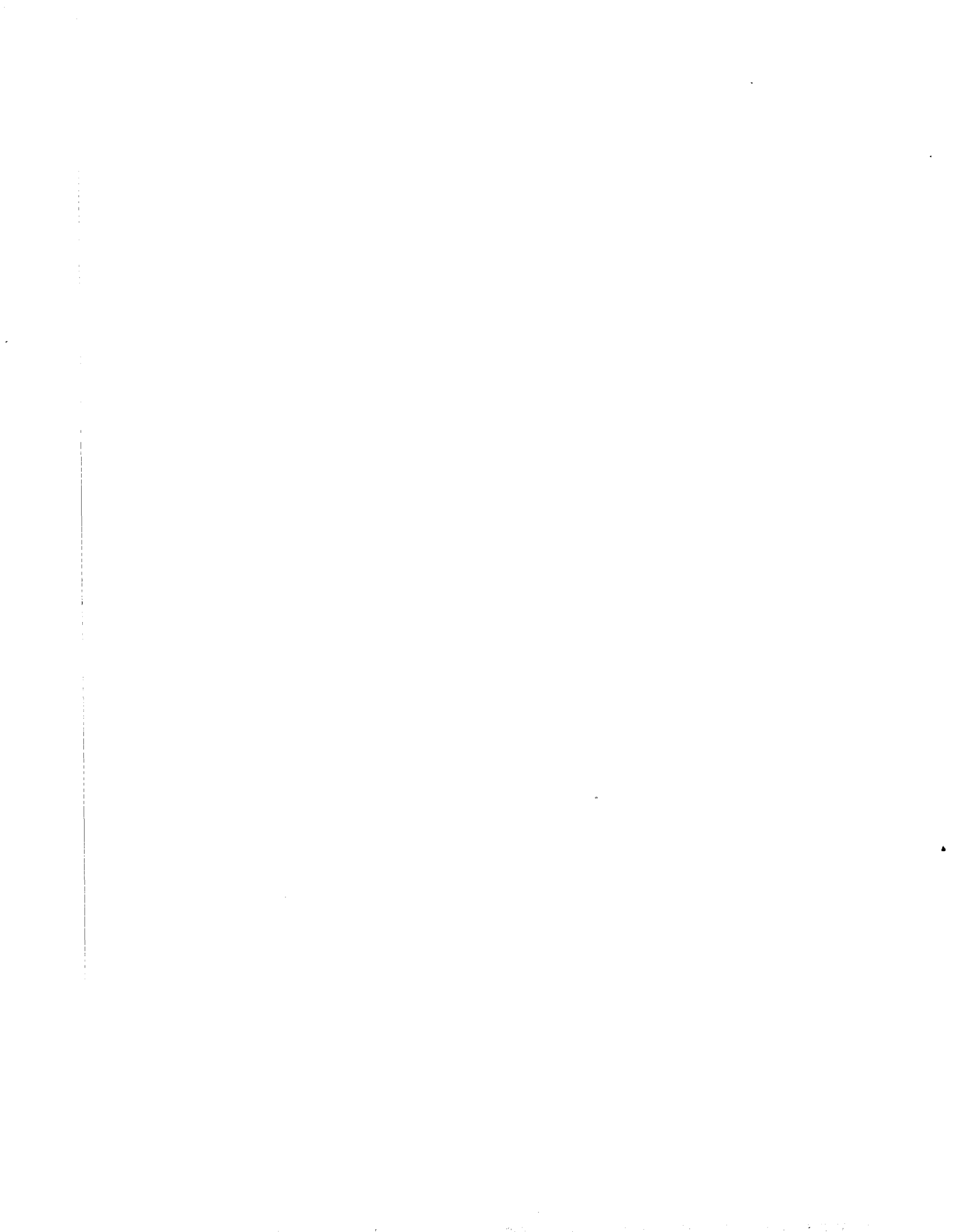
To the President of the Senate and the
Speaker of the House of Representatives

Each year the Environmental Protection Agency (EPA) makes decisions which have significant impacts on the health and economic well-being of the Nation's citizens. Accurate and reliable air quality data is an essential component used in formulating many of these decisions, evaluating their impact, and in determining future strategies. EPA has experienced serious difficulties in obtaining this data; this report discusses these problems and offers recommendations for corrective action.

We are sending copies of this report to the Administrator, Environmental Protection Agency; the Director, Office of Management and Budget; interested congressional committees; and Members of Congress.

A handwritten signature in cursive script that reads "Charles A. Bowsher".

Comptroller General
of the United States



D I G E S T

Nearly \$300 billion will have been spent by public and private sources to improve air quality from 1979 to 1988. The Clean Air Act requires the Environmental Protection Agency (EPA) to establish a nationwide air quality monitoring network to provide accurate, reliable data concerning air quality. GAO undertook this review to determine the network's status and found that EPA's progress in implementing this mandate has been slow and costly and has not yet resulted in full implementation of a reliable air monitoring network. EPA's problems in establishing and operating the network and in handling air quality data raise questions about the data's reliability.

EPA needs accurate, reliable air quality data to use in making decisions which affect the Nation's health and economic welfare. GAO believes EPA should resolve the system's problems and fully implement the network as soon as possible.

WHY EPA NEEDS ACCURATE,
RELIABLE AIR QUALITY DATA

EPA is responsible for directing the Nation's multi-billion-dollar air pollution abatement efforts. It needs sound air quality data to determine where the pollution problems are so that it will know where to focus its efforts and can determine the effect of its cleanup and control programs. Trend data for measuring progress in cleaning up the air is supplied by 5,300 air monitoring sites around the country. Without accurate, timely, comparable, and reliable data, EPA cannot effectively determine the level of pollutants in the air, assess whether its past policies have been effective, and provide sufficient scientific data for use in future policy decisions.

Accurate air quality data is also essential for EPA's enforcement of the Clean Air Act and as a basis for establishing and revising the ambient air quality standards, which set the maximum air pollutant levels permitted. For instance, EPA uses monitoring data to determine when and where

air quality standards have not been met. When air quality does not meet the standards, the affected areas must take measures to decrease pollutant emissions.

EPA's AIR MONITORING NETWORK
DOES NOT FULLY MEET ITS STANDARDS

Although EPA views establishing a reliable air monitoring network as a top priority and has made progress in achieving that goal, progress has been slow, costly, and has not resulted in such a network.

The quality of air monitoring data depends on the proper siting of monitoring stations, reliable and uniform equipment, and proper quality assurance controls. In 1979 GAO issued a report entitled "Air Quality: Do We Really Know What It Is?" (CED-79-84, May 31, 1979) describing EPA's problems in obtaining reliable data from monitors which did not meet these criteria. On May 10, 1979, EPA issued regulations to correct reported deficiencies and establish a monitoring network to obtain valid and timely data which is comparable among the States for five pollutants. According to EPA, about \$84.6 million in EPA grant funds and \$92.6 million in State and local agency funds have been spent during fiscal years 1978-81 to implement and operate the network. (See p. 11.)

The first phase of this air monitoring effort was establishing the National Air Monitoring Stations network to provide air quality data to EPA. EPA's regulations required this system to be operational by January 1, 1981; by June 30, 1981, 59 percent of the required air monitors met EPA standards. As of June 1982, the number of acceptable monitors had increased to over 70 percent.

Even with full implementation of the National Air Monitoring Stations network, EPA will not have fulfilled its air quality monitoring responsibilities. This network is about one-fourth of the currently planned system. A State and Local Air Monitoring Stations network also is required to provide annual air quality data for the States' use in developing pollution control strategies. EPA's implementation deadline is January 1, 1983. EPA officials believe that the network will be fully operational by this deadline; however, as of June 1982, less than half of the sites in the State and Local Air Monitoring Stations network

met the regulations' requirements. GAO doubts that EPA will meet the deadline. (See pp. 9 and 13.)

EPA statistics reveal that the air monitoring networks have not been completely implemented primarily because of a lack of approved quality assurance controls. Program officials cite the high costs of quality assurance controls as a reason why some State and local agencies have not fully implemented the controls. Additionally, the State and local air agencies may have program needs that differ from EPA's, and in some instances they have chosen to work toward other air program goals. EPA does not specify how the air grant funds are to be spent; rather, it relies on voluntary cooperation among the State and local agencies to implement its regulation. EPA's voluntary approach, however, has not resulted in the full implementation of the regulation.

Further challenges remain after the monitoring networks are established. EPA must expand them in the future to monitor for lead and a revised particulate matter standard. The lead monitoring network had a July 1982 implementation deadline. However, as of January 1, 1982, only 37 percent of the required monitors were operational. As of July 1982, 83 percent were operational according to EPA. Implementing the new particulate matter network will entail replacing some existing monitors with new ones; however, EPA has not yet developed the needed monitoring methodology. (See pp. 11 and 12.)

DATA HANDLING PROBLEMS AFFECT RELIABILITY

To ensure data reliability, EPA established requirements for collecting, processing, and reporting air quality data. However, EPA and the States did not follow these requirements and did not establish procedures needed to correct data handling problems. EPA is trying to determine the cause of data handling problems; however, its efforts are limited by a lack of procedures to identify those monitors which are not reporting air quality data. (See pp. 20 and 39.)

Additionally, EPA's computer edit procedures are not sufficient to always identify erroneous data

submittals. GAO found an example where EPA did not detect that 63 percent of the data required by EPA regulations had been omitted.

Unauthorized changes to the air quality data base may also affect the data's reliability and ultimately its credibility. To preclude this, EPA has established stringent procedures that must be followed before changes can be made to the data base. GAO found, however, that in one case over 900,000 deletions to the data base were made without the required EPA approval. Although the impact of these changes cannot be fully measured, they raise serious questions about the data base's credibility. (See p. 22.)

RECOMMENDATIONS TO THE ADMINISTRATOR

To fully implement EPA's air monitoring regulation, GAO recommends that EPA include a condition in its grant agreements with the States that all funds designated to meet EPA's air monitoring standards be spent to achieve these standards. (See p. 13.)

To correct data handling problems, GAO recommends several actions to standardize and expand EPA's data handling procedures. GAO also recommends that the Director of EPA's Monitoring and Data Analysis Division be responsible for verifying compliance with these requirements.

RECOMMENDATION TO THE CONGRESS

In amending the Clean Air Act in 1977, the Congress required EPA to promulgate regulations establishing a uniform air monitoring system throughout the country to provide accurate, timely, representative, and comparable data. To date those air monitoring networks are not in place and it is uncertain when they will be achieved. Therefore, to provide the needed impetus for completing the network in a timely manner, the Congress should, in consultation with the EPA Administrator, establish a deadline by which the networks must be operational, after considering factors such as the technological state of the art and the availability of resources. (See p. 13.)

AGENCY COMMENTS AND GAO EVALUATION

EPA disagreed with GAO's draft report, saying that many statements were based on misinterpretations

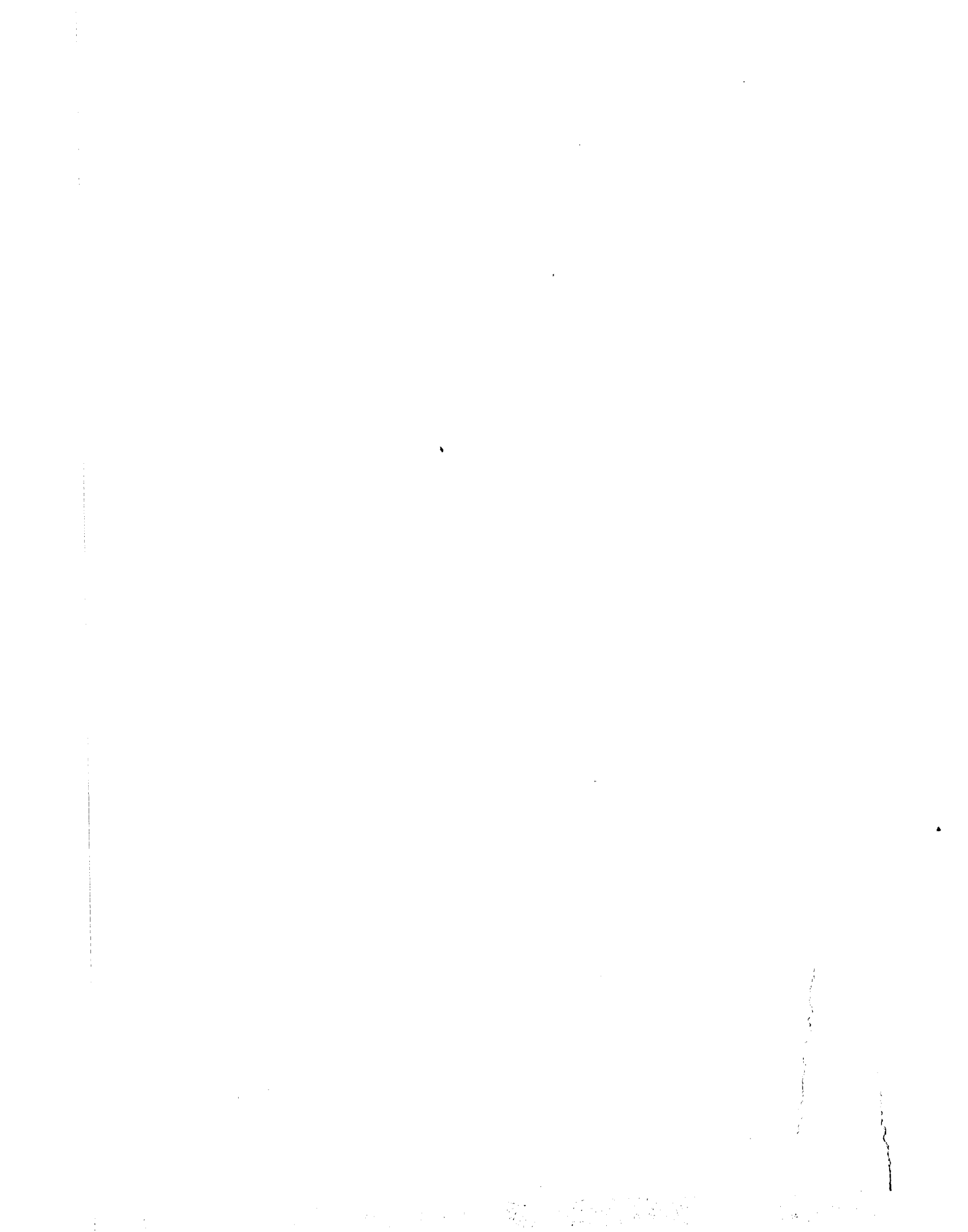
of data and information. EPA also stated that GAO's findings and conclusions were not substantiated by EPA's review of the record. The following points summarize EPA's objections to the draft report and GAO's responses:

- EPA believes that the National Air Monitoring Stations network is complete. This assessment is based on EPA's opinion that all requirements for completing the network have been fully met. GAO disagrees. GAO reviewed 13 of the 15 agencies with conditionally approved quality assurance plans and found that requirements for full approval clearly were not met in each case. (See pp. 13 and 14.)

- EPA stated that requiring States to agree to a condition in their grant agreements that funds designated for implementing the air monitoring networks be spent for that purpose penalizes the States. GAO believes that such a requirement is a good management practice since currently these funds are not always spent for those purposes for which they were provided. (See p. 15.)

- EPA agreed that improvements in the procedures and practices controlling the collection and handling of data were needed. EPA stated that it would implement GAO's recommendation for a standardized operating procedure. (See p. 24.)

- GAO had proposed that the Chief, National Air Data Branch, be responsible for collecting, reporting, and ensuring data validity. EPA disagreed, stating that GAO had not provided sufficient rationale for this proposal. After reviewing the situation, GAO determined that the scope of the problem exceeds the branch chief's authority. GAO is now recommending that the Director, Monitoring and Data Analysis Division, should be appointed data base manager to ensure that accurate, reliable, timely, and complete data is obtained. (See pp. 23 and 24.)



C o n t e n t s

		<u>Page</u>
DIGEST		i
CHAPTER		
1	INTRODUCTION	
	EPA's air quality monitoring networks	1
	Uses of air quality data	2
	Objective, scope, and methodology	3
2	EPA LACKS RELIABLE AIR MONITORING NETWORKS	5
	Slow progress in implementing reliable monitoring networks	5
	EPA has not yet established reliable air monitoring networks	7
	EPA to monitor for additional pollutants	11
	Conclusions	12
	Recommendations to the Administrator, EPA	13
	Recommendation to the Congress	13
	Agency comments and our evaluation	13
3	INADEQUATE DATA HANDLING AFFECTS DATA'S RELIABILITY	17
	How the data handling system operates	17
	Data submitted to EPA's regional offices is of questionable or unknown reliability	18
	Data is neither timely nor complete	20
	Unauthorized changes adversely affect data's credibility	21
	Effect of using unreliable data	22
	Conclusions	22
	Recommendations to the Administrator, EPA	23
	Agency comments and our evaluation	23
APPENDIX		
I	List of offices GAO contacted	25
II	Federal, State, and local funds used to implement the monitoring networks	27
III	Letter dated July 12, 1982, from the Associate Administrator for Policy and Resource Management, Environmental Protection Agency	28

ABBREVIATIONS

EPA	Environmental Protection Agency
GAO	General Accounting Office
NADB	National Air Data Branch
NAMS	National Air Monitoring Stations
SLAMS	State and Local Air Monitoring Stations

CHAPTER 1

INTRODUCTION

Air pollution is a serious problem affecting both the health and economic well-being of the Nation. The Council on Environmental Quality's Annual Report for 1980 reveals that nearly \$300 billion will have been spent by public and private sources to improve air quality during the period 1979-88. The Environmental Protection Agency (EPA) is primarily responsible for the Nation's efforts to control air pollution. EPA works with State and local monitoring agencies to collect data on the types and amounts of pollutants in the air to determine

- the severity of the national air pollution problem,
- the areas within States which have pollution problems,
- the health effects of air pollution on the population,
- the measures which should be taken to control air pollution, and
- the effectiveness of the control measures.

EPA'S AIR QUALITY MONITORING NETWORKS

Section 319 of the Clean Air Act, as amended (Public Law 95-95, 42 U.S.C. §7619 et seq.), requires EPA to establish an ambient air quality monitoring network. To fulfill this legislative mandate, EPA promulgated a regulation on May 10, 1979, to ensure that accurate, timely, representative, and comparable data was being collected by the States. EPA stated that implementation of this regulation was a top priority and provided the States with \$20 million in grant funds to implement it. Currently, about 5,300 ambient air quality monitors located throughout the country provide ambient air quality data to EPA and the States.

States operate the State and Local Air Monitoring Stations (SLAMS) network to collect air quality data for five pollutants: nitrogen dioxide, carbon monoxide, sulfur dioxide, particulate matter, ^{1/} and ozone. EPA also required the establishment of a National Air Monitoring Stations (NAMS) network, a subset of SLAMS, designed to provide ambient air quality data (for the same pollutants) to determine the national air quality. NAMS data is reported directly to EPA, whereas SLAMS data is primarily for use by State and local air monitoring agencies.

^{1/}Any particle of matter small enough to be inhaled into the human body, such as dust, soot, or ash.

USES OF AIR QUALITY DATA

Accurate and reliable air quality data is extremely important to EPA, the Congress, the States, and the public as it forms the basis of many policy decisions which significantly affect the Nation's health and economic welfare. Air quality data is a critical element in many of the pollution control strategies developed by EPA and the States. For instance, EPA uses air quality data to determine whether each State meets the National Ambient Air Quality Standards established under the Clean Air Act. These standards are designed to reduce and control air pollution and protect the population's health. States which do not meet these standards must begin an extensive and expensive process of developing control measures to meet the standards, such as instituting automobile inspection and maintenance programs and implementing air pollution control strategies which impose costs on the public and affected businesses.

The Clean Air Act also requires EPA to review the National Ambient Air Quality Standards every 5 years. Before EPA issues a revised standard, it considers various alternative standards. Each alternative may require the States to implement a different air pollution control strategy, and each alternative will impose a different cost level on the States and the public. EPA needs accurate air quality data to determine which alternative standard should be selected and how to revise the standard to obtain the greatest improvement in air quality for the least cost. In addition, Executive Order 12291, dated February 17, 1981, requires that a cost-benefit analysis be prepared whenever any Federal agency subject to this order, including EPA, issues major new regulations. EPA needs accurate air quality data to prepare these cost-benefit analyses.

Both EPA and the 97th Congress have used air quality data during the Clean Air Act's reauthorization. For example, the current EPA Administrator has used this data in developing EPA's proposed automobile and truck emissions standards. Also, several congressional committee and subcommittee chairmen have requested air quality data from EPA to use during hearings and in preparing their proposed amendments to the Clean Air Act.

Air quality data is also used to resolve interstate pollution abatement petitions (Section 126 of the Clean Air Act, as amended) filed by one State against another State (or States) alleging that pollution from these States is contributing to the petitioner's air pollution problem. The resolution of these cases will determine which State must begin costly cleanup measures which could have a negative impact on the affected State's economic growth. Inaccurate data could lead to incorrect resolution of the cases and the wrong State(s) could be required to undertake control measures, or a State(s) might be required to implement more or less stringent control measures than are necessary to address the problem.

Studies to establish the health effects of various pollutants depend upon the use of ambient air quality data. For example, a health research project concerning the incidence, distribution, and control of diseases affecting school children used ambient air quality data to establish the children's pollutant exposure level. Inaccurate data could have led to incorrect conclusions concerning the effects of pollution on school children's health.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this review was to determine whether EPA can accurately obtain, assess, and report ambient air quality data in a timely manner. Specifically, we intended to determine whether

- EPA had established a national air monitoring system as required by the Clean Air Act;
- EPA accurately reports on the quality of the Nation's air to the Congress; and
- EPA is using accurate, reliable air quality data to assess the effectiveness of air pollution control strategies and to make policy decisions affecting both the economic and physical well-being of the Nation.

In our previous report, "Air Quality: Do We Really Know What It Is?" (CED-79-84, May 31, 1979), we identified significant problems in EPA's air monitoring program, including the improper siting of air monitors, use of unacceptable equipment, and the lack of quality assurance procedures. As a result of these problems we concluded that EPA's air quality data was of unknown quality.

On May 10, 1979, EPA issued regulations to correct quality, completeness, and timeliness deficiencies in the air quality monitoring and reporting programs. Subsequently, in fiscal years 1979 and 1980 EPA provided State and local air agencies \$20 million to establish and implement a national air monitoring system in accordance with these regulations. EPA's objective was to ensure that the air monitoring networks were properly designed and operated, which in turn would ensure that the networks produce accurate, reliable air quality data.

Our audit approach was to develop the statistical data necessary to determine how many monitoring sites conform to the regulation. During our review we determined whether EPA met its January 1, 1981, deadline for completing the NAMS network and evaluated its progress toward completing SLAMS by its deadline of January 1, 1983.

To determine the status of the implementation of NAMS and SLAMS, we collected data from all 10 EPA regions describing each State's progress in implementing the systems. (EPA's regional offices are responsible for ensuring that each State and local monitoring agency collects the data and reports it to EPA's

National Air Data Branch (NADS), located at Research Triangle Park in Durham, North Carolina.) We reviewed agency documents and interviewed officials responsible for EPA's air quality program at both EPA headquarters and regional offices responsible for individual air quality monitoring systems. (See app. I for a list of the EPA offices visited.) Because the EPA regional offices are diverse and exercise significant discretion in conducting their monitoring programs, we visited 4 of the 10 regional offices. The following guidelines were used to select the regions we visited:

- The progress States within each region had made in implementing the May 1979 regulations. Data supplied by the 10 EPA regional offices allowed us to select regions containing States which have successfully progressed toward implementing the regulations as well as States which experienced problems in implementing them.
- The number of monitors in the region. Forty-eight percent of the NAMS monitors are contained within the regions visited.
- One EPA region examined in the previously noted GAO report. We visited the region to follow up on the problems identified in that earlier review.
- Monitoring agencies with conditionally approved quality assurance plans. We reviewed 13 of the 15 agencies which had conditional approval.

The data collected from all regions was reviewed to determine compliance with EPA's May 1979 regulations and to identify areas where EPA was having problems implementing the monitoring networks. We also used internal EPA data, compiled from data submitted by the States, on the status of the network; however, we did not verify its accuracy. Whenever this data is used it is identified as EPA data.

We reviewed EPA's air quality monitoring data base, the National Aerometric Data Bank, to assess the effectiveness of internal controls over the collection, review, processing, and storage of air quality data, as well as the completeness and accuracy of the data. Deficiencies in any of these areas could have an adverse impact on the system's integrity. Our work was done in accordance with our "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions." Our audit was conducted from July 1981 to March 1982.

CHAPTER 2

EPA LACKS RELIABLE

AIR MONITORING NETWORKS

EPA and others, including the Congress, have recognized the need for air monitoring networks which produce accurate, reliable air quality data. The Clean Air Act, as amended in 1977, requires that EPA issue uniform air monitoring standards to be used in establishing a national air monitoring system. Although EPA has issued these standards, their implementation has been slow, costly, and to date has not resulted in air monitoring networks which fully meet EPA's standards, primarily because the networks lack approved quality assurance controls. Although most State and local agencies have purchased and are operating the required equipment, many still operate sites without fully approved quality assurance controls. Several factors contribute to this problem, including cost, timeliness, and EPA's voluntary approach to implementing its air monitoring regulation.

Until EPA has fully implemented its air monitoring standards, the air monitoring networks will produce data of unknown reliability. Additionally, the quantity of air quality data EPA must obtain is increasing: a 1981 regulation now requires EPA to expand the air monitoring networks to include lead, and an additional regulation soon to be finalized will require even further expansion of the networks.

SLOW PROGRESS IN IMPLEMENTING RELIABLE MONITORING NETWORKS

EPA and others have long recognized the need for reliable air monitoring networks. In October 1975 an EPA task force was formed to review air monitoring activities. The resulting report entitled "Air Monitoring Strategy for State Implementation Plans" (June 1977) recommended that an approved air monitoring network be implemented by a joint Federal-State-local effort. The study emphasized the importance of complete, precise, accurate, comparable, and timely data. The task force described monitoring activities which needed attention and made recommendations for improvement. The task force identified five problems with the air monitoring program:

- More monitoring sites were operating than were needed to determine ambient air quality and to develop trend data.
- Many monitoring sites were located in areas which were not suitable for monitoring.
- Quality assurance programs were not fully implemented.
- The lack of high quality data precluded routine trend analysis.

--Much of the air trend data was of unknown quality.

The task force proposed that EPA take several corrective actions, including:

- Modifying existing monitoring regulations to establish a national air monitoring network and a State and local air monitoring network to be implemented in January 1981 and January 1983, respectively.
- Expanding its efforts to establish a formal, comprehensive quality assurance program.
- Issuing guidance to State and local air pollution control agencies on the collection of source emission data for national trend analysis.
- Standardizing the use of statistical and simulation modeling techniques.
- Developing a uniform air quality index.

The task force also proposed that EPA develop uniform criteria for conducting air quality monitoring and for designing the monitoring networks. During several congressional hearings in 1975 and 1976, the issue of inadequate air quality monitoring data was raised. Based on these hearings, in August 1977 the Congress amended the Clean Air Act to establish, among other things, the need for a standardized, comprehensive national air monitoring system. Section 319 of the Clean Air Act, as amended, requires EPA to promulgate uniform, nationwide monitoring standards to establish a national monitoring network. These regulations were to be promulgated by August 1978.

In May 1978 the Chairman, Subcommittee on Environment, Energy, and Natural Resources, House Committee on Government Operations, requested that we examine the adequacy of EPA's air quality monitoring programs. Our report, "Air Quality: Do We Really Know What It Is?" (CED-79-84, May 31, 1979), identified many of the same deficiencies the EPA task force identified and found that

- 72 percent of the monitors were sited incorrectly,
- 58 percent of the equipment in use was not certified by EPA, and
- 81 percent of the monitoring sites had one or more problems which could adversely affect the data's reliability.

On May 10, 1979, 9 months after the mandated deadline, EPA issued regulations delineating the criteria to be followed by the State and local monitoring agencies in establishing the air

monitoring networks. The National Air Monitoring Stations (NAMS) network was established to provide quarterly air quality data for EPA to use in preparing national policy analyses, trends development, and reports on the air quality in major metropolitan areas. Additionally, a State and Local Air Monitoring Stations (SLAMS) network was required to provide annual air quality data for the States to use in determining the pollutant levels in highly populated areas and general background concentration levels. The regulations developed uniform criteria for the State and local monitoring agencies to follow in establishing the networks and set deadlines requiring all NAMS and SLAMS monitors to be operational, sited in accordance with the regulations' siting criteria, and included in a quality assurance program by January 1, 1981, and January 1, 1983, respectively.

EPA believes that implementation of the regulations will ensure the production of accurate, reliable data. In addition, a 1981 National Commission on Air Quality study agreed with EPA that accurate, reliable data would not be produced until both NAMS and SLAMS are fully implemented. However, in our 1979 report we found that EPA had been slow in correcting air monitoring deficiencies. We concluded that EPA would not meet its deadlines for implementing reliable air monitoring networks because implementation requires EPA, in conjunction with the State and local agencies, to take several costly and time-consuming measures, including buying and siting air monitoring equipment, training staff, and implementing quality assurance plans.

EPA HAS NOT YET ESTABLISHED RELIABLE AIR MONITORING NETWORKS

EPA's goal of implementing its air monitoring standards by establishing a National Air Monitoring Stations network by January 1981 was not met even though EPA viewed the effort as a high priority project. In fact, EPA provided the State and local air agencies with \$20 million to purchase and site NAMS air monitors. Additionally, EPA provided an estimated \$85 million in grant funds to support the air monitoring networks in fiscal years 1978 through 1981.

A significant number of air monitoring sites, according to EPA statistics, still operate without an approved quality assurance plan. According to EPA program officials, this is due to the high cost associated with the quality assurance control requirements and the fact that some State and local program officials believe controls are not needed until all the other standards have been implemented (purchasing equipment, siting monitors, etc.). Additionally, according to EPA, it does not tell the State and local programs how to spend the grant funds; it requires only that the money be spent for air programs. EPA believes that the best approach for implementing its regulation is through voluntary cooperation among the State and local agencies. However, because of different State and local program needs, this approach has not

resulted in the full implementation of EPA's air monitoring regulations.

Status of NAMS and SLAMS

Although NAMS was to be operational by January 1981, it was only 59 percent complete in June 1981; as of the last reporting date during our audit (December 1981), it was 76 percent complete.

The status of the NAMS network as of June 30, 1981 (6 months after the deadline), and as of December 31, 1981 (1 year after deadline), is shown in the subsequent table.

Status of NAMS Network (note a)

	<u>June 30, 1981</u>		<u>December 31, 1981</u>	
	<u>Number of monitors</u>	<u>Percent of network</u>	<u>Number of monitors</u>	<u>Percent of network</u>
Total planned network	1,270		1,266	
Monitors using unacceptable or uncertified equipment	38	3	7	1
Monitors improperly located	94	7	19	2
Monitors not operational	39	3	27	2
Monitors operating without a fully approved quality assurance program	421	33	276	22
Monitors meeting all requirements	<u>b/753</u>	59	<u>b/ 967</u>	76

a/This data was obtained from internal EPA documents.

b/Several monitors failed to meet more than one of the above criteria; therefore, the number of monitors meeting the requirements and the number of monitors not meeting the requirements do not add up to the total number of monitors in the network.

Even with the complete implementation of NAMS, EPA will not have fulfilled its air monitoring responsibilities. NAMS is about one-fourth of the currently planned total system; SLAMS is also required to comply with the regulation. With less than 1 year remaining before SLAMS is to be operational, 55 percent of the

monitors do not meet EPA's requirements (see the following chart). EPA officials believe they can meet the 1983 deadline. However, we believe that this deadline will not be met in light of EPA's experience to date in attempting to implement NAMS and because of the relatively short period of time remaining in which EPA must correct SLAMS siting and operational problems as well as establish approved quality assurance procedures.

Status of SLAMS Network
on January 1, 1982 (note a)

	<u>Number of monitors</u>	<u>Percent of network</u>
Total planned network (note b)	4,023	
Monitors using unacceptable or uncertified equipment	31	1
Monitors improperly located	435	11
Monitors not operational	368	9
Monitors operating without a fully approved quality assurance program	1,535	38
Monitors meeting all requirements	<u>c/</u> 1,808	45

a/This data was obtained from internal EPA documents.

b/Does not include NAMS.

c/Several monitors failed to meet more than one of the above criteria; therefore, the number of monitors meeting the requirements and the number of monitors not meeting the requirements do not add up to the total number of monitors in the network.

As EPA's statistics reveal, the lack of required quality assurance controls still is the major problem in fully implementing EPA's standards. Although most State and local agencies have made progress in purchasing and properly siting the required equipment, they have been slow to develop the needed quality assurance procedures.

Need for more emphasis on establishing quality assurance programs

EPA's regulations established quality assurance procedures to assess, control, and improve the quality of the monitoring data. Each State is required to develop and implement a quality control program consisting of policies, procedures, specifications, standards, and documentation necessary to

- provide data of adequate quality to meet monitoring objectives and
- minimize the loss of air quality data due to equipment malfunctions.

In addition, the quality control program must be described in detail, documented, and approved by the EPA regional administrator.

As of December 31, 1981, only 47 of the 64 monitoring agencies which collect NAMS and SLAMS data had EPA-approved quality assurance programs. Of the 17 agencies which did not have fully approved programs:

- Fifteen agencies have conditionally approved plans. These plans have not received full approval because the agencies have not established all required written procedures and provided EPA with sufficient documentation to enable the EPA regional administrators to adequately review the programs.
- One agency's plan was not approved by EPA because not enough information was submitted to enable the regional administrator to determine how the agency was planning to implement the program.
- One agency did not submit a quality assurance program for approval.

According to EPA officials, cost is one of the major reasons that States have not sufficiently documented their quality assurance plans. Specifically, highly trained personnel are needed to develop and test the quality assurance procedures, and according to an EPA official, some State and local program officials believe that other requirements (such as purchasing, siting, and setting up the required equipment) need to be fulfilled before the quality assurance requirements are implemented.

Also, according to an EPA regional office official, EPA does not tell the State and local air agencies specifically how to spend the grant money. Rather, it encourages the agencies to spend the money for certain items, believing that voluntary cooperation is the best approach for implementing its regulation. As noted in chapter I, reliable air quality data is equally important to the State and local agencies. Sometimes, however, the agencies have different program needs than EPA and as a result spend the grant funds to satisfy these other requirements. For instance, a State may elect to spend the grant money on enforcing air quality standards rather than on air monitoring and implementing EPA's monitoring regulation.

Implementing the networks has been costly

EPA estimates that over \$177 million has been spent by Federal, State, and local agencies to implement and operate the air monitoring networks. Federal grant funds have been provided to State and local air pollution control agencies to implement the regulations and establish the networks. Funds were provided on a matching basis with the receipt of Federal funds contingent upon a proportion of the Federal dollars being matched by State and local funds.

An estimated \$85 million in EPA air pollution grant funds has been used for establishing and operating the ambient air monitoring networks in fiscal years 1978 through 1981. State and local air pollution control agencies' matching funds for monitoring totaled approximately \$92.6 million during this period. (For details see app. II.)

In 1979 EPA estimated that \$21 million for nonrecurring expenditures (monitors, siting, and data handling equipment) was needed to implement the May 10, 1979, regulation. Subsequently, in fiscal years 1979 and 1980 EPA provided State and local agencies with nearly \$20 million in addition to the basic grant funds to implement the regulations.

EPA TO MONITOR FOR ADDITIONAL POLLUTANTS

As previously discussed, EPA is responsible for monitoring all pollutants for which ambient air quality standards have been established. As of January 1982 EPA had promulgated ambient air quality standards for six pollutants--particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead and, as previously noted, monitors for all but lead. EPA is currently implementing a monitoring system for lead and is revising the standard for particulate matter; achieving both objectives will require expanding the monitoring networks.

Lead monitoring

Lead is the most recently promulgated ambient air quality standard. The standard was established on October 5, 1978, but it was not until September 1981 that EPA promulgated the regulation and data reporting requirements implementing lead monitoring. Lead monitors in the NAMS monitoring network are scheduled to be fully operational by July 1, 1982. However, as of January 1, 1982, only 38 (37 percent) of the required NAMS monitors were operational. As of July 1982, 83 percent were operational according to EPA's Chief, Monitoring Section. Furthermore, according to an EPA official, State and local air agencies had established lead monitors that were easy to co-locate with other monitors; the monitors which are more difficult to site have not yet been installed. The primary difficulty in installing the monitors is in finding available sites which meet the stringent siting criteria. For

instance, the monitor must be placed higher than 6 feet but not more than 23 feet above the ground and between 16 and 49 feet from the roadway. In major metropolitan areas it is difficult to find buildings which are only one story tall, to meet the height standard, and are far enough from the street to meet the distance criteria.

Revised particulate matter standard

In accordance with the Clean Air Act requirement to review the ambient air standards every 5 years, EPA recently reviewed the particulate matter standard to determine its adequacy. EPA's scientific review committee recommended that the standard be changed based on its assessment of the criteria, current data, and studies. Thus, EPA developed and plans to propose later this year a new standard for particulate matter; when issued, this standard will replace the current particulate matter air quality standard.

Once the new standard is promulgated, EPA will propose a modification to its air monitoring regulation to include the new standard. EPA has not fully developed the needed monitoring methodology but estimates that 500 monitors, with a current estimated cost of \$1.5 million, will be needed. The annual operation and maintenance cost for these monitors has not been determined.

Additional standards

In addition to the pollutants previously discussed, EPA has identified 43 other hazardous pollutants for which it plans to propose and promulgate source standards, if warranted. If, after studying these pollutants, EPA determines that any are widely distributed in the environment, an ambient air standard would be established and thus monitoring networks to measure their concentration would be required. However, according to an EPA air program official, an initial assessment of the 43 pollutants suggests that the pollutants are not widespread throughout the environment and therefore may not require extensive monitoring networks.

CONCLUSIONS

EPA believes that in order to obtain reliable air quality data it first must establish air monitoring networks which fully meet its standards for siting, maintenance, and quality assurance controls to ensure the collection of accurate, reliable data. We agree with EPA's position. However, after several years of effort and an investment of \$177 million, these standards are still not fully implemented primarily because many air monitoring sites are operating without fully approved quality assurance controls. Several factors contribute to this problem: the high cost of implementing quality assurance controls and the State and local air agencies' efforts to meet other EPA monitoring requirements first. Additionally, EPA does not specifically designate how Federal air grant funds will be spent. Rather, EPA prefers to enlist the voluntary cooperation of the State and local agencies;

however, to date this approach has not resulted in the full implementation of EPA's monitoring regulations.

Reliable air quality data is important to both the States and EPA. EPA, in conjunction with the State and local monitoring agencies, sought to establish a NAMS network by 1981 to be followed by a SLAMS network by 1983. These networks would fully meet EPA's standards and would provide reliable air quality data to both EPA and the States. However, EPA did not meet its goal for NAMS. Additionally, the implementation of SLAMS (which is three times larger than NAMS) is only 45 percent complete with less than a year remaining before its operational deadline; given these factors and EPA's experience in trying to implement NAMS, we doubt that EPA will be able to meet this goal either. Even with the implementation of the networks, EPA is faced with the problem of expanding them to monitor for an additional pollutant--lead--and revising the monitoring methodology for particulate matter. Therefore, we believe that until these networks are fully operational, the air quality data will continue to be of unknown reliability.

RECOMMENDATIONS TO THE ADMINISTRATOR, EPA

To achieve the full implementation of its air monitoring standards and the establishment of reliable air monitoring networks in a more timely manner, EPA should require State and local air agencies to fully implement its May 1979 regulation. Therefore, we recommend that the Administrator, EPA, in consultation with the States, include as a condition in EPA's grant agreement with the States that all funds designated to meet EPA's air monitoring standards be spent to achieve these standards.

RECOMMENDATION TO THE CONGRESS

In amending the Clean Air Act in 1977, the Congress required EPA to promulgate regulations establishing a uniform air monitoring system throughout the country to provide accurate, timely, representative, and comparable data. To date the air monitoring networks are not in place and it is uncertain when they will be completed. Therefore, to provide the needed impetus for completing the network in a timely manner, the Congress should, in consultation with the EPA Administrator, establish a deadline by which the networks must be operational, after considering factors such as the technological state of the art and the availability of resources.

AGENCY COMMENTS AND OUR EVALUATION

EPA disagreed with our conclusion that a uniform national air monitoring system providing accurate, timely, representative, and comparable data is still not in place. EPA contends that as of June 1, 1982, over 95 percent of the NAMS network met all of EPA's requirements. We believe that only 73 percent of the network met all of EPA's requirements by this date. EPA's calculations differ from ours because they included monitors which are operating under

"conditionally" approved quality assurance procedures. EPA asserted that conditional approvals were given only when format and other minor organizational discrepancies were present. According to EPA all substantive parts of the quality assurance plans must be acceptable to receive conditional approval.

We disagree. As of January 1982 we reviewed 13 of the 15 agencies with conditional approvals. We found that all 13 (1) had substantive problems which we believe would prevent the agencies from fully implementing all of the required quality assurance procedures or (2) were unable to provide sufficient documentation showing that the plans met all the requirements, which would enable EPA's regional administrator to review and approve the plans. The problems we found with the quality assurance plans are listed below, and as noted these problems are more serious than mere format or other minor discrepancies.

- An EPA regional office NAMS coordinator, responsible for ensuring that the monitors fully comply with EPA's criteria, told us of six agencies within his region which he believed lacked sufficient personnel to perform the audits and calibrations necessary to implement an approved quality assurance program.
- An assessment report prepared by a NAMS coordinator described one local agency that did not have certified equipment to perform the required precision and accuracy tests. The memorandum concluded that only with properly certified equipment could the agency ensure the quality of the data produced by its continuous monitors. (This agency is included in the above category as it also does not have sufficient personnel.)
- In another EPA region, the Chief of the Field Operations Section, Air Management Division, said that two agencies lacked the technical expertise to perform required precision checks and some of another State's monitors were inaccessible and therefore a quality assurance plan was not developed for them.
- Several EPA officials informed us that six agencies received conditional approvals because they were unable to provide sufficient documentation showing that the plans met all the requirements which would enable the EPA regional administrator to review and approve the plans. (Several of these agencies also experienced some of the problems described above.)

We believe these examples demonstrate that EPA's position that conditional approvals were only granted when all substantive parts of the quality assurance plans were available and acceptable is incorrect. We therefore continue to believe that data from States with conditionally approved quality assurance plans is of questionable reliability, and until EPA is satisfied with and

grants full approval of their quality assurance plans, it is not assured that the data collected from these sites meets EPA's standards.

EPA disagreed with our conclusion that it will be unable to implement SLAMS by January 1, 1983. EPA stated that as of June 1, 1982, 60 percent of the planned monitors fully met the requirements in its regulations. We disagree. EPA has included conditionally approved monitors in the completed SLAMS total; without the conditionally approved monitors only 38 percent of the SLAMS fully met all of EPA's requirements.

We also note that the size of the SLAMS network has been reduced significantly since January 1, 1982, from a planned 4,023 to 3,754 monitors. This reduction alone accounted for 4 percent of the purported increase in the percentage of the network completed that EPA displays in enclosure 3.

EPA also indicated that the States were responsible for ensuring that SLAMS provided accurate, timely data and that EPA's role is only to oversee the State and local agencies' progress and recommend changes. We disagree; EPA's role in the past has been and continues to be far greater than mere oversight. For example, EPA and State and local officials have worked together on developing the required number and location of monitors in the present networks. EPA has provided funds to establish and operate SLAMS. EPA uses SLAMS data in its decisionmaking processes, and SLAMS is a component of the State Implementation Plans which are required by the Clean Air Act.

We believe that EPA will not meet its January 1983 deadline for implementing SLAMS. In light of EPA's slow progress in implementing its monitoring networks, we continue to believe that the Congress should establish a deadline for completing all requirements, after considering factors such as the technological state of the art and the availability of resources.

EPA did not agree with our proposal that a condition should be included in EPA's grant agreements with the States requiring that all funds designated to meet EPA's air monitoring standards be spent to achieve these standards. We disagree with EPA; conditions for expending funds should be included in each grant agreement to ensure that the funds are spent for the purposes for which the funds were provided. EPA's regional offices' records did not show whether the money provided to States for NAMS and SLAMS was spent on these networks; instead, the records show that the funds were included in each State's air monitoring program funds and were used according to the State's discretion. For instance, an EPA regional office official stated that one State spent some of the NAMS and SLAMS funds on enforcement. EPA believes that attaching conditions to its grant agreements would be penalizing the States, but does not explain its rationale for this view. The Congress has authorized these funds to be used in obtaining accurate, reliable data; we believe that these funds should be expended to achieve

this goal. The House Committee on Science and Technology stated that "the quality, consistency, and compatibility of environmental data on air pollution around the country is woefully deficient to the point of impairing the Nation's ability to make sound environmental decisions" and must be improved. We believe that these grant funds will be spent for the purposes they were intended in all cases only if conditions are included in the grant agreements and that requiring grant funds to be spent to achieve the goals for which they were given is merely good management.

CHAPTER 3

INADEQUATE DATA HANDLING

AFFECTS DATA'S RELIABILITY

EPA needs accurate, reliable air quality data to fulfill its mandated responsibilities. As discussed in chapter 2, EPA has attempted to establish air monitoring networks which meet its standards; it has also established procedures and requirements for collecting, handling, and processing air quality data designed to ensure the data's reliability and, ultimately, its credibility. However, we found problems in performing these functions which adversely affect the air quality data's reliability.

Specifically, we found that:

- Data submitted is of questionable reliability. For example, EPA established criteria for judging the reliability of air quality data collected by each monitor; however, less than half the States met these criteria during the first three quarters of 1981.
- Data submitted is neither timely nor complete, and EPA does not have the procedures necessary to determine why.
- Unauthorized changes to the data base affect its reliability.

All of these problems raise serious questions concerning the reliability of the air quality data which EPA relies on to execute its responsibilities.

HOW THE DATA HANDLING SYSTEM OPERATES

EPA has established procedures and requirements for collecting, handling, and processing air quality data. The State and local monitoring agencies are responsible for operating the monitoring networks in accordance with these regulations. EPA is to advise and assist the monitoring agencies as well as determine whether the agencies are operating the networks in accordance with the regulations.

Each air monitor accumulates data about the pollutant concentration in the air being sampled. After the State and local monitoring agencies collect this data from the monitors, they submit either documents or computer tapes containing the air quality readings to the EPA regional offices. The EPA regional offices edit and process the data and then submit computer tapes to the National Air Data Branch (NADB) in North Carolina. NADB again edits the data and approves it, and then the data is available for use by EPA, the States, universities, consultants, and others.

We found problems adversely affecting the data's reliability throughout this process. These problems are discussed in the following sections.

DATA SUBMITTED TO EPA'S REGIONAL OFFICES
IS OF QUESTIONABLE OR UNKNOWN RELIABILITY

EPA has established criteria to determine each air monitor's capability to collect accurate air quality data and therefore to determine the data's reliability. However, less than half the States met these criteria during the first three quarters of 1981. EPA officials believe the lack of quality assurance controls is one of the main reasons why such a high percentage did not meet the criteria. Additionally, EPA edit procedures do not identify all errors in the data submitted by the State and local monitoring agencies.

EPA defines accuracy as the degree to which the data generated reflects the actual air quality. To achieve this objective, an independent analyst (usually an EPA regional office official) goes to each monitor in the network on a regularly scheduled basis and inserts a known concentration of a test gas into the monitor to obtain a reading. The monitor's reliability is then determined by calculating the difference between the actual concentration of the gas and the concentration recorded by the monitor.

EPA has established a criterion for each monitor requiring recalibration if the data generated during these accuracy tests is not within plus or minus 15 percent of the test gas' concentration. (Recalibration of each monitor which does not produce data within these limits is performed so that after recalibration it will produce data which is reliable, i.e., data which accurately reflects the actual air quality.) Less than half the States met this criterion during the first three quarters of 1981 for their sulfur dioxide, carbon monoxide, nitrogen dioxide, and ozone monitors. Most States met the criterion for particulate matter. The following table shows the number of States that failed to meet EPA's criteria during the most recent quarter for which data was available:

States Failing To Meet EPA's Criteria
During the Third Quarter of 1981 (note a)

	Number of States failing to meet criteria (note b)	Number of States reporting	Percent of States failing to meet criteria
Sulfur dioxide	18	29	62
Carbon monoxide	14	26	54
Nitrogen dioxide	11	22	50
Ozone	17	28	61

a/This data was obtained from internal EPA documents. It is based on EPA computations of the average NAMS accuracy tests for each State which describe the 95 Percent Probability Limit range.

b/Includes States which reported data reliability and States which did not report data reliability.

Data reported from States whose monitors did not meet EPA's criteria does not accurately reflect the actual air quality and therefore is of questionable reliability. Furthermore, data from States which did not report whether their data meets EPA's criteria also is of questionable value because EPA does not know whether this data accurately reflects the actual air quality. EPA regional officials said that one of the primary reasons for the States' and local agencies' failure to provide data which meets EPA's criteria is the lack of quality assurance controls. (See chap. 2.)

EPA's review procedures do not
identify all erroneous data

EPA has problems in obtaining data which accurately reflects the actual air quality, and these problems are compounded by the fact that EPA's computer edit procedures do not identify all errors in the data submitted by the States. EPA officials told us that the procedures do not always identify errors in the data, such as:

- Extreme values. One or more data elements may exceed the expected range by an unreasonable amount and still remain undetected.
- Errors in the placement of decimal points. For example, .028 is reported as 0.280.
- Errors in the amount of data presented. We found an example in which only 37 percent of the data required by the regulations was collected, and EPA's review procedures did not detect that 63 percent of the required data was not submitted.

In addition, all data added to EPA's data base is not subject to these routine data reviews. For example, data from the Tennessee Valley Authority is routinely added to the data base; however, because these monitors are not in the NAMS or SLAMS networks, EPA does not subject this data to the routine data reviews. This illuminates a serious flaw in the data bank--data of unknown quality is present in the data bank and is available to the various users without being identified as such.

EPA headquarters NAMS coordinator also pointed out that the quality of data forwarded from the EPA regional offices varies greatly. One EPA region manually reviews all data and as a result forwards a high quality product. Another region uses an effective set of locally programmed edits to develop a good quality data submission. In contrast, however, the coordinator told us of another region which forwarded incomplete data. EPA's edit programs fail to identify all of these deficiencies, and therefore EPA cannot correct them.

DATA IS NEITHER TIMELY
NOR COMPLETE

EPA is responsible for preparing and issuing air quality trend analyses. To meet this requirement, the agency needs complete and timely air quality data; however, we found that the data submitted by the States is often neither timely nor complete. Most EPA regional offices do not have sufficient computer procedures in place to identify which monitors are or are not reporting data; consequently, EPA cannot always follow up with the State and local agencies to identify the causes and solve the problems which cause them to submit untimely or incomplete data.

To obtain timely data, EPA requires that the State and local monitoring agencies submit to the EPA regional offices either documents or computer tapes containing the air quality readings taken from each monitor for that quarter. The regional offices submit data to the NADB within 90 days of the end of each calendar quarter.

During 1981, 13 States submitted data late. EPA received this data from 2 weeks to 3-1/2 months late. Data from two of these States was submitted after EPA's 90-day reporting deadline and therefore was not added to EPA's data bank automatically. Additionally, as of January 26, 1982, 16 States had not submitted any data to the EPA regional offices for one or more quarters: 1 State failed to submit data for the first quarter of 1981, 5 States failed to submit second quarter 1981 data, and 16 States failed to submit third quarter 1981 data.

EPA defines complete data as that which includes monitor readings from at least 75 percent of the total number of opportunities EPA had to collect this data. According to EPA procedures, data submissions which include less than 75 percent of the total number

of possible observations are not statistically representative or valid. However, EPA's experience has been that State and local agencies have not always submitted a sufficient quantity of data observations to obtain a statistically representative sample. For example, we found, based on EPA statistics, that only 55 percent of the NAMS monitors took enough readings to meet EPA's completeness criteria for the third quarter of 1981. In addition, only 75 percent of the NAMS monitors met the completeness criteria during the first and second quarters of 1981.

Most EPA regional offices do not have sufficient computer procedures to determine which individual monitors have not submitted air quality data; therefore, they are unable to pursue this matter with the State and local agencies to determine why the data was not provided and to obtain it. This impairs the regional offices' ability to determine which monitors have not taken enough readings to provide a complete or statistically representative sample.

Additionally, we found that EPA's air program headquarters also does not routinely determine which monitors have not submitted data. Neither the Monitoring and Reports Branch, which is responsible for obtaining the data from the EPA Regional Offices, nor the National Air Data Branch, which is responsible for maintaining the data base, has the capability to determine, for all regions, which monitors are not submitting data. Therefore, EPA is unable to take corrective action.

EPA officials are concerned about the timeliness and completeness problems, and EPA regional offices are currently querying State and local monitoring agency officials to determine the causes.

UNAUTHORIZED CHANGES ADVERSELY AFFECT DATA'S CREDIBILITY

EPA has established stringent procedures to be followed for changing air quality data after it is received and entered into the National Air Data Branch's computers. According to EPA such procedures are important to maintain the data's reliability and, ultimately, its credibility. However, no one person at NADB is accountable for verifying that these procedures are followed; consequently, the procedures are not always followed and failure to do so is not always detected.

According to EPA policy, data which is not received by the agency within 90 days of the end of the calendar quarter is not to be added to the NADB data bank and corrections may not be made without the approval of the EPA headquarters NAMS coordinator. Major changes, such as the addition of previously missing data or large changes to previously submitted data, require written justification before they can be made. The headquarters NAMS coordinator is required to evaluate the impact of the changes on the data base and send a memorandum to the Chief of the

Monitoring Section, Monitoring and Data Analysis Division, at Research Triangle Park, North Carolina, summarizing the major changes and their possible implications. We found, however, that the internal controls preventing such changes were not always followed.

For example, in February 1982, California submitted 980,986 delete transactions to the air quality data base for the period of January-June 1981. This was followed by the submission of 1,386,466 additions to the same data for the same period. These changes were made after the 90-day data reporting deadline; however, the coordinator responsible for overseeing the State's data base bypassed the controls which prevent inclusion of data submitted after the deadline and allowed the changes to be made. The coordinator involved told us he could not tell what data had been changed or what effect these changes could have on future analysis. In this case the NADB did not follow the NAMS procedures and neither the EPA regional office nor the NAMS coordinator prepared the required written justification and analysis of the change's impact. According to an EPA official, other such changes have occurred in the past, and although it is difficult to fully assess their relative impact on the reliability of the data base, it does raise questions about the data's credibility.

EFFECT OF USING UNRELIABLE DATA

Data handling problems raise questions about the reliability of air quality data--but what is the effect of using unreliable data? Although we recognize that air quality is not the sole input used in making air-related decisions, it is, as discussed in chapter 1, an important ingredient in many decisions which affect all of us. One example which shows that potential impact occurred when one locality, based on air quality data, decided to institute an automobile inspection and maintenance program which would cost about \$5 million. Of the total cost, about \$4.8 million would have been borne by the residents subject to the program. However, after the data was reevaluated and found to be inaccurate, the decision was rescinded.

CONCLUSIONS

EPA needs accurate, reliable air quality data to fulfill its mandated responsibilities. However, problems with collecting, processing, and reporting air quality data raise serious questions concerning the reliability of the data. Although EPA has established procedures to safeguard the data's integrity and credibility, these procedures are not always followed. Additionally, EPA needs other procedures to identify all erroneous data. It cannot determine which monitors are or are not collecting data and thus cannot determine the cause for incomplete data submissions, nor can it obtain the data.

Finally, data submitted does not always meet EPA's criteria for timeliness or reliability. In short, the reliability of EPA's air quality data remains questionable and EPA still lacks the accurate, reliable data it needs to fulfill its responsibilities under the Clean Air Act.

RECOMMENDATIONS TO THE ADMINISTRATOR, EPA

To ensure that data submitted is accurate, reliable, timely, and complete, we recommend that the Administrator designate the Director, Monitoring and Data Analysis Division, as the air quality data base manager. This designee should have overall responsibility and accountability for:

- Overseeing EPA's regional office efforts to collect, review, and process the data to verify that EPA's regulations are being followed.
- Developing procedures requiring the Chief, National Air Data Branch, to prepare a list of the monitors which did not submit data during each quarter and forwarding this list to the Monitoring and Reports Branch. The Chief, Monitoring and Reports Branch, will be responsible for ascertaining from the responsible agencies why these monitors did not report data and, if possible, obtaining the missing data.
- Precluding unauthorized changes from being made to the data base and requiring that the Chief of the Monitoring Section, Monitoring and Data Analysis Division, coordinate with the Chief, National Air Data Bank, to confirm that the impact of all changes to the data base has been determined before changes are made.

To correct air quality data reporting and handling problems, we recommend that EPA develop one set of procedures to be used in each EPA regional office to ascertain which monitors have not submitted data during each reporting period and to ensure that all data is obtained from the States. These procedures should identify erroneous data so that corrections can be made.

AGENCY COMMENTS AND OUR EVALUATION

In commenting on our draft report's proposal that the Chief, National Air Data Branch, be designated as data base manager, EPA responded that it was satisfied with the current organizational structure and management and did not believe that our report presented sufficient rationale for altering this structure.

Our recommendations are designed to correct several existing problems which affect collecting and reporting air quality data as well as safeguarding the data's integrity. Currently, the overall responsibility for these activities is split between the Chief, Monitoring and Reports Branch, Monitoring and Data Analysis Division (collecting and reporting data), and the Chief, National

Air Data Bank (maintaining data integrity). We believe that these functions are interdependent and require close coordination and cooperation. The problems we have identified to a large extent result from the failure to ensure that required procedures are followed and the lack of coordination between the two branches. We have found that the Monitoring and Reports Branch does not have the capability to determine which monitors have not reported data and therefore cannot follow up with the State and local agencies to obtain this data; the National Air Data Branch does not have this capability either. Therefore, missing data is not routinely obtained from State and local agencies. We believe that these problems can be corrected by clearly identifying and consolidating responsibility in one person and making that person responsible for ensuring that the various subordinate functions are executed.

We therefore have revised our proposal and now recommend that the Director, Monitoring and Data Analysis Division, should have overall responsibility for collecting and reporting air quality data and for the reliability of that data. The Chief, Monitoring and Reports Branch, should ensure that the NAMS coordinators carry out their responsibilities, including obtaining missing data. The Chief, National Air Data Bank, should be responsible for ensuring that the Monitoring and Reports Branch determines the impact of any data base changes before they are made to preserve the data base's credibility. We discussed our recommendations with EPA officials and they concurred.

EPA agrees with our recommendation concerning its data base and has agreed to take corrective action.

LIST OF OFFICES GAO CONTACTED

The following is a list of EPA offices we contacted during our review. Offices we personally visited are denoted by asterisks.

EPA headquarters, Washington, D.C.

- * Office of Air, Noise, and Radiation
- Office of the Comptroller
- Office of the Inspector General
- * Office of Management Systems and Evaluation
- * Office of Policy and Resource Management
- * Office of Public Affairs
- * Office of Research and Development

EPA regional offices

- Region I, Boston, Massachusetts
- Region II, New York, New York
- * Region III, Philadelphia, Pennsylvania
- * Region IV, Atlanta, Georgia
- Region V, Chicago, Illinois
- * Region VI, Dallas, Texas
- Region VII, Kansas City, Missouri
- Region VIII, Denver, Colorado
- * Region IX, San Francisco, California
- Region X, Seattle, Washington
- Idaho Operations Office, Boise, Idaho

EPA offices at Research Triangle Park, North Carolina

- * Office of Air, Noise, and Radiation, Office of Air Quality Planning and Standards
- * Office of Research and Development, Environmental Criteria and Assessment Office

* Office of Research and Development:

Environmental Monitoring and Systems Laboratory

Environmental Sciences Research Laboratory

Health Effects Research Laboratory

Industrial Environmental Research Laboratory

FEDERAL, STATE, AND LOCAL FUNDSUSED TO IMPLEMENT THE MONITORING NETWORKS

<u>Fiscal year</u>	<u>Estimated Federal grant funds used for monitoring</u>	<u>Estimated Federal funds used for implementing the new regulations</u>	<u>Estimated State and local funds used for monitoring</u>	<u>Estimated funds used for monitoring</u>
	----- (millions) -----			
1978	\$15.6	-	\$14.4	\$ 30.0
1979	14.0	\$11.7	23.3	49.0
1980	16.4	8.0	26.4	50.8
1981	<u>18.9</u>	<u>-</u>	<u>28.5</u>	<u>47.4</u>
Total	<u>\$64.9</u>	<u>\$19.7</u>	<u>\$92.6</u>	<u>\$177.2</u>



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 12 1982

OFFICE OF
POLICY AND RESOURCE MANAGEMENT

Mr. Henry Eschwege
Director
Community and Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Mr. Eschwege:

The Environmental Protection Agency (EPA) has reviewed the General Accounting Office (GAO) draft report entitled "Reliability of EPA's Air Quality Data Is Suspect." Public Law 96-223 requires that the Agency submit comments on the report for consideration when preparing the final report. Following are our comments based on the recommendations to Congress and EPA. Also, we are enclosing additional findings referenced to specific pages of the draft report (Enclosure 1).

EPA found that many of the statements in the report are based on misinterpretations of data and information. Moreover, the findings and conclusions are not substantiated by our review of the record. Therefore, our comments will address the recommendations and major findings because we have found small factual errors to be so numerous that we cannot provide complete corrections in the time period allowed.

GAO Recommendation

GAO recommends that the Congress should establish a deadline by which the networks must be operational, taking into consideration such factors as the technological state-of-the-art, and the availability of resources.

EPA Comment

We disagree with the conclusion that a national uniform air monitoring system that provides accurate, timely, representative and comparable data is not in place and that it is uncertain when it will be achieved. We are providing a current status report on both the National Air Monitoring Station (NAMS) and State and Local Air Monitoring Station (SLAMS) network (see Enclosures 2 and 3).

Generally the statistics provided in the enclosed status reports are comparable to the data provided on page 8 of the draft GAO report. The exception is the category of monitors operating without an adequate quality assurance program as of December 31, 1981. On page 10 of the draft report, it states that only 47 of the 64 monitoring agencies which collect NAMS and SLAMS data had approved quality assurance programs. Apparently it concluded that any monitor that was operating under a conditional approval was not providing data of a known quality. This conclusion is flawed as conditional approvals were not given unless all substantive parts of the quality assurance plan were acceptable, i.e., unless the agency had the ability to report precision and accuracy information on the data sets. If the monitoring agency did not submit a plan that provided for collection and recording of precision and accuracy data according to the criteria set forth in 40 CFR Part 58, it was disapproved. Conditional approvals were given when only format and other minor organizational discrepancies were apparent.

Sixty-two of the sixty-four monitoring agencies have approved or conditionally approved plans (11 have conditional approvals), and those agencies provided precision and accuracy data for 95 percent of the air quality data submitted from both the NAMS and SLAMS networks in 1981 (Enclosure 4). Even the two monitoring agencies whose plans were not approved reported precision and accuracy data for some of their monitors. These two monitoring agencies account for some 48 NAMS monitors and since their quality assurance reporting did not fully meet with our requirements, we would declare a portion of their data as being of unknown quality. The draft report's conclusion that 276 monitors did not have an adequate quality assurance program overstates the problem by over five-fold.

Our records show that as of June 1, 1982, better than 95 percent of the NAMS network fully meets all requirements of 40 CFR Part 58. We doubt that the network can ever achieve 100 percent as any monitoring network is dynamic in nature. Extraneous factors, loss of leases, demolition of buildings, new construction, etc., will periodically result in either the relocation or deletion of some monitoring sites. We consider the NAMS network to be essentially completed and that it is providing accurate, timely data that are meeting the requirements of the Agency and State and local organizations. In addition, we believe that it fully complies with section 319 of the 1977 Clean Air Act. We therefore do not believe that it would be of value for the Congress to establish a date for NAMS networks completion.

The SLAMS network is not due to be completed until January 1, 1983. Our records show that as of June 1, 1982, 60 percent of the planned monitors meet all requirements of 40 CFR Part 58. We foresee that the SLAMS network will be more dynamic than NAMS with the States more frequently expanding or contracting their networks to meet their respective needs. It is the States' responsibility to see that the networks provide accurate, timely data that is annually certified and reported to EPA. In addition, EPA provides an oversight role through an annual review of the States' monitoring plans and recommends changes that may be required. In our oversight role we do not foresee any major problems that would preclude the completion of the SLAMS network by January 1, 1983. For Congress to set into law a completion date for the SLAMS network does not seem to be practical or necessary.

GAO Recommendation

GAO recommends that the Administrator, EPA, in consultation with the States, include as a condition in EPA's grant agreement with the States that all funds designated to meet EPA's air monitoring standards be spent to achieve these standards.

EPA Comment

We believe that this recommendation is counter to the Agency's policy of returning more responsibility and authority to the States in order for them to meet their particular needs. We also believe that such a requirement is not needed as the vast majority of the States have fully complied with the monitoring regulations mandated in 40 CFR Part 58.

Only when a State is reluctant to meet its obligations should a grant be conditioned with penalties attached. This is rarely necessary, but was done in the case of one State for failure to develop an adequate monitoring program. This action was effective and the State is now beginning to comply with the regulation. To routinely condition each grant in every program would create a morass of paper work, be resource intensive and be counter-productive to Federal-State relationships.

GAO Recommendation

GAO recommends that EPA develop one set of procedures to be used in each EPA regional office to ascertain which monitors have not submitted data during each reporting period and to ensure that data is obtained from the States. These procedures should identify erroneous data so corrections can be made.

EPA Comment

We believe that the Agency's overall system to manage data reporting from NAMS monitors is functional and provides for a validated data base. Briefly, the system ranges from computer edit checks through computerized screening procedures (gap and pattern tests) to the actual visual inspection by the NAMS coordinator of the five highest pollutant concentrations reported quarterly from each NAMS monitor. We do agree that some of the visual inspection burden could be replaced with computerized inspections and we will proceed to develop such software. We also agree that all regional offices should use standard operating procedures. We will supply additional program guidance and oversight to the regional offices to overcome any current problems.

GAO Recommendation

GAO recommends that the Administrator, EPA, designate the Chief, National Air Data Branch, as the air quality data base manager. This designee should have overall responsibility and accountability for

- overseeing EPA's regional office efforts to collect, review, and process the data to verify that EPA's regulations are being followed and
- precluding unauthorized changes from being made to the data base and coordinating with the Chief of the Monitoring Section, Monitoring and Data Analysis Division to confirm that the impact of all changes to the data base has been determined before changes are made.

EPA Comment

As there is no supporting reason why this recommendation was made, we can only reply by explaining the present management system and identifying the management officials presently held responsible for the quality and timely reporting of air quality data.

The Chief, Monitoring and Reports Branch, Monitoring and Data Analysis Division, is the person held responsible for the accuracy and timely reporting of NAMS data. He carries out the responsibility of this position by supervising the programs assigned to the Monitoring Section of the Branch. The Chief of the Monitoring Section, in turn, directly supervises the four NAMS coordinators who are held responsible for the NAMS network in the regions assigned to them. The "National Air Monitoring Station (NAMS) Network Procedural Manual" fully describes the coordinator's role in the NAMS network operation. We believe that this management system has operated successfully and effectively as proven by the States adherence to the 40 CFR Part 58 regulation.

The States are and should be held responsible for the SLAMS network operation, data accuracy, and reporting with the regional offices providing oversight to the program. The SLAMS annual report, which is a summary of the States air quality data as described in 40 CFR Part 58 Appendix F, must be certified by the State's senior air pollution control official as being correct, to the the best of his/her knowledge.

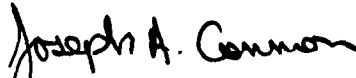
The Chief, National Air Data Branch, is responsible for operation, maintenance and storage of the Air Programs Environmental Data Base which consists of ambient air and source emissions data.

The respective responsibilities have been a management decision of long standing with the Agency and the draft report does not furnish any persuasive evidence that the decision was in error or should be changed.

In view of our basic and almost total disagreement on the status of the national monitoring networks and the quality of the data reported to the Agency, a meeting of senior officials of GAO and EPA should be considered to reopen the GAO investigation with the aim of producing a more accurate report.

We appreciate the opportunity to comment on this draft report prior to its publication. We hope that you find our comments useful in clarifying the report and its analysis.

Sincerely yours,



Joseph A. Cannon
Associate Administrator
for Policy and Resource Management

Enclosures

ENCLOSURE ICOMMENTS AND CLARIFICATIONS ON GAO DRAFT REPORT:
RELIABILITY OF EPA'S AIR QUALITY DATA IS SUSPECT

Page 2: We recommend that the sentence on line 10, starting with "States which", be revised. The inspection and maintenance program discussed here is an expense generally borne by individual citizens rather than just business. Additionally, expenses borne by business are generally passed on to consumers in one way or another. Therefore, we suggest the sentence read as follows:

States which did not meet these standards must begin an extensive and expensive process of developing control measures to meet these standards, such as instituting automobile inspection and maintenance programs and implementing air pollution control strategies which impose costs on both citizens and affected businesses.

[GAO Comment: We have revised the report to incorporate EPA's comment.]

Page 2: Since Executive Order 12291 covers most Federal agencies, we suggest that the sentence beginning with "In addition" on line 25 be revised to read:

In addition, Executive Order 12291, dated February 17, 1981, requires that a cost-benefit analysis be prepared whenever any Federal agency subject to the Executive Order, including EPA, issues a new major rule.

[GAO Comment: We have revised the report to incorporate EPA's comment.]

Page 2: To more accurately explain section 126 of the Clean Air Act, we recommend that the sentence beginning on line 36, "Air Quality Data," be revised as follows:

Air quality data is also used to resolve interstate pollution abatement petitions (Section 126 of the Clean Air Act, as amended) filed by one State against another State or States alleging that pollution from the State or States is contributing to the complainant State's air pollution problem.

[GAO Comment: We have revised the report to incorporate EPA's comment.]

GAO Note: For consistency in type, we have retyped EPA's enclosures I, II, III, IV, and V.

Page 2: Since over-control or under-control measures can result from inaccurate data, we recommend that the sentence beginning with "Inaccurate data" on line 42 be revised to read:

Inaccurate data could lead to the incorrect resolution of the cases and the wrong State could be required to undertake control measures or a State might be required to control either more or less than is necessary to address the problem.

[GAO Comment: We have revised the report to incorporate EPA's comment.]

Page 6: The draft report continues to use data from the previous GAO report, "Air Quality: Do We Really Know What It Is?" The statistics taken from that report follow:

- 72 percent of the monitors were sited incorrectly,
- 58 percent of the equipment in use was not certified by EPA, and
- 81 percent of the monitoring sites had one or more problems which could adversely affect the data's reliability.

These statistics were then, and continue to be, flawed. The siting criteria used by GAO were not the same as described in 40 CFR Part 58 and the statistics were from a sampling of less than five percent of the monitors in operation at that time. A sampling of less than five percent is not a valid representation of the national total.

[GAO Comment: In two letters, both dated December 3, 1979, from EPA's Assistant Administrator for Planning and Management to the Chairmen, Senate Committee on Governmental Affairs and House Committee on Government Operations, EPA stated that the Agency had reviewed our report and did not have any major disagreements with the report's recommendations to the Administrator. That report identified several problems with ambient air monitoring efforts during the 1970's. The statistics cited from the report describe the state of the air monitoring system at that time and were cited in this report to provide background information on the program's history and to point out the many problems that confronted EPA.]

Page 11: The statement, "EPA estimates that over \$177 million has been spent by Federal, State, and local agencies for the implementation of the air monitoring networks," is misleading. The States and EPA estimated the resources necessary to comply with the new air quality monitoring provisions prior to promulgation of the regulations. These resource estimates indicated that approximately \$21 million for nonrecurring expenditures (monitoring instrumentation, siting, and equipment for data handling and quality assurance) were required. In addition, an increase of \$6.7 million over the existing program cost for recurring items (site operation, quality assurance audits, data handling, and reporting to the public) was needed.

In FY 1979, approximately \$12 million were allocated to the States over the usual basic grant for monitoring. In FY 1980, an additional \$8 million were provided. This sum of approximately \$20 million was for the nonrecurring costs. The decrease in unneeded SO₂ and NO₂ bubblers and TSP 1/ samplers has provided a savings of approximately \$8.3 million, while the increase in cost for continuous CO, NO₂, SO₂, and O₃ monitors was calculated to be about \$2 million. The net savings of \$6.3 million approximates the increase in annual recurring costs to implement the new networks. Therefore, the cost of implementing the new networks was approximately \$20 million in non-recurring costs, while the operating costs of the new networks are comparable to the old networks.

[GAO Comment: We have added the words "and operate" to the statement on page 11. EPA's estimates of the funds expended to implement and operate NAMS and SLAMS agree with our estimates.]

1/Particulate matter monitors.

Page 15: The statements, "EPA has not finalized its criteria for determining the reliability of air quality data; however, as an interim measure, EPA officials have established a goal that reliable data is data which is judged to be within plus or minus 15 percent of the actual air quality. Less than half the States which reported air quality data met this goal during the first three quarters of 1981 for their sulfur dioxide, carbon monoxide, nitrogen dioxide, and ozone monitors," are also incorrect. EPA has not set or inferred quantitative criteria for judging the reliability of air quality data submitted by the States. The limits of plus or minus 15 percent are recommended in the Quality Assurance Manual as limits for recalibration of continuous monitors for test points at 80 percent full scale of the monitor's active range. This limit was never intended to be applied in evaluating the reliability of NAMS/SLAMS data.

However, the NAMS accuracy data reported for calendar year 81 (Enclosure 5) is in total disagreement with the GAO statistics provided in the table on page 15. Our records show that well over 80 percent of the mean accuracies reported were within plus or minus 10 percent of the true audit concentrations. At the plus or minus 15 percent level, 3 pollutants (total suspended particulates, 1/ carbon monoxide and ozone) were virtually at the 100 percent level, sulfur dioxide was in the high nineties and nitrogen dioxide was in the low nineties. The results indicate to us that an effective quality control program is being implemented by agencies comprising the NAMS network. We, therefore, disagree strongly with GAO's finding that "EPA statistics reveal that the air monitoring networks have not been fully implemented primarily because of a lack of approved quality assurance controls, as summarized on page iii.

[GAO Comment: We have revised the report to clarify our definition of accuracy and reliability. Our analysis is based on the average accuracy ranges for each State. EPA's response to our draft report is based on the percent of agencies reporting mean accuracy figures. Mean accuracy was calculated by averaging each monitoring agency's upper and lower probability limits. We believe that the range is a better measure of the data's accuracy (and therefore its reliability) for the following reasons.

--EPA uses State accuracy ranges to compare each State's progress with that of other States.
State accuracy ranges are reported to each data user as an indicator of the data's accuracy.

1/Particulate matter.

--EPA regulations require recalibration of each monitor when its accuracy range exceeds plus or minus 15 percent. Recalibration is required so that the monitor will produce data which is reliable, that is, data which accurately reflects the actual air quality.

--When EPA calculated the mean accuracy figures, significant information was lost. Our table is based on ranges which show the dispersion of the accuracy values. For example, one State's range is -17 to +10 which indicates that data from this State's monitors would be from 17 percent below the actual value to 10 percent higher than the actual value. To obtain EPA's mean accuracy figure, the table averaged the low and high values from each State, and thus the dispersion is no longer apparent. The low value, -17, indicates that one of the State's monitors exceeded the point where recalibration was required (-15) and should be recalibrated to ensure that the monitor will produce accurate and reliable data. EPA's calculation, which only presents an average of both values, obscures this point.

[In evaluating enclosure 5, we found that it was based on only a small percentage of the monitoring agencies which reported precision and accuracy data. Only 21 percent of the ozone, 15 percent of the nitrogen dioxide, 27 percent of the carbon monoxide, 16 percent of the sulfur dioxide, and 38 percent of the particulate matter monitoring agencies were included in EPA's calculations. (These percentages are estimates because the detailed supporting documentation used to prepare enclosure 5 was unavailable for our examination. We prepared these estimates based on the partial documentation EPA provided.) Our table on page 18 includes all the monitoring agencies that had reported data to EPA.

[We disagree with EPA's assertion that enclosure 5 indicates that an effective quality assurance program has been fully implemented. As noted on pages 9 and 10 of the report, the quality assurance program has not been fully implemented due to lack of resources, differences in priorities, and the 15 monitoring agencies with conditionally approved quality assurance programs. In addition, we examined each State's accuracy figures and found several times where the 95-percent probability limits exceeded the trigger point (-15, +15) requiring monitor recalibration, which raises questions about the reliability of data from these monitors.]

Page 16: In the section entitled "EPA Review Procedures Do Not Identify All Erroneous Data," GAO states that:

- "Extreme values: One or more elements may exceed the expected range by an unreasonable amount and still remain undetected.
- decimal point omissions. For example, .03 is reported as 3.
- errors in the amount of data presented. We found an example in which only 8 percent of the data required by the regulations was collected, and EPA's review procedures did not detect that 92 percent of the required data was not submitted."

The GAO office in Raleigh was contacted and asked to provide us with support for the above statements. Upon review of the material provided to us, we found the following:

Extreme value. The value was a one-hour concentration reported from Indiana. The data tape was submitted to the National Air Data Bank in January 1982 and was included in the computer file update that took place between January 5-20, 1982. The error was discovered in the routine NAMS data review in the latter part of January and the Regional Office was notified of the error on February 1, 1982. The error was routinely corrected in an update of the computer files.

[GAO Comment: This example is intended to show how EPA's edit procedures in the regional office and at the National Air Data Branch did not detect this error before it was added to the data bank. EPA's edit procedures are intended to prevent erroneous data from being added to the data bank.]

Decimal point omission. The example provided to us was not one of a decimal point omission. The concentration units, which were in micrograms per cubic meter, were apparently misread as parts per million. The value of 3 is correct and is not an example of a decimal point omission.

[GAO Comment: We agree with EPA and have replaced this example with one of the other examples of decimal point errors we found.]

Errors in the amount of data presented. The example provided represented data from the Tennessee Valley Authority (TVA). TVA has, for a number of years, submitted air quality data from their monitoring stations on a voluntary basis. Since TVA monitors are not in the NAMS or SLAMS network, we do not subject their data to our routine data reviews. Therefore, we cannot accept this as a valid example of errors in the amount of data presented.

[GAO Comment: This example demonstrates that data which has not been subjected to quality assurance controls is in the National Air Data Bank. Quality assurance controls were established to ensure that the data collected for use by EPA, other Federal and State agencies, academia, and others in research and the policymaking process would be accurate and reliable. This example illuminates a serious flaw in the data bank: data of unknown quality is in the data bank and is available to various users. These examples of serious flaws in data in the National Air Data Bank cast doubt on the effectiveness of the procedures used to prevent errors in the data base and on the credibility of its data.

[We have added another example, taken from EPA's computer records, showing that significantly less data was reported than is required from a SLAMS monitor.]

Page 17: The reference to the National Air Data Bank is correct as stated. However, as of June 1, 1982, all States had reported all four quarters of 1981 data to the regional offices. There were data processing problems associated with two regional offices at the time the GAO inventory was made. However, there were on-going actions to resolve these difficulties which have lead to their resolution.

[GAO Comment: EPA agrees that some data is missing and other data was added to the National Air Data Bank late. However, EPA stated as of June 1, 1982, all States had reported data from four quarters of 1981. It said data which was late or missing resulted from data processing problems associated with two regional offices and that EPA had resolved these difficulties.

[The missing and late data described in our report was from 8 of EPA's 10 regional offices. EPA only commented on actions taken by two of these eight offices; it made no mention of attempts to resolve the problems in the remaining six regional offices. In addition, our follow-up investigation revealed that the data processing problem had not been resolved in at least one of the two regions where EPA claimed it had taken corrective action. An EPA official told us this regional office is still

having data processing problems and the personnel in this region are being scheduled for additional training in the near future to attempt to resolve this problem.]

Page 18: Under the section entitled "Effect of Using Unreliable Data", the report uses the example of a monitor error which could have lead to the mandatory operation of an automobile inspection and maintenance program. While no mention of the State or city involved is made, we believe it to be Kansas City, MO.

This event was highly publicized in both the newspaper and the radio/television media. The erroneous measurements were made during the period April 1978 August 1979. The faulty calibration of the monitor was found during a joint EPA-State quality assurance audit conducted in August 1979. Upon finding that the ozone data were in error, the mandated inspection and maintenance program was rescinded. EPA agrees that such an error could have been costly to the public if it had not been found. We would like to point out that the example is more than three years old, occurred before the present monitoring quality assurance regulations could be fully implemented, and was detected even without a formally approved quality assurance plan.

[GAO Comment: EPA recognizes the need for accurate, reliable air quality data and agrees that the use of erroneous data can have significant adverse economic effects. In this example, the error in EPA's data was found only after the data was reevaluated, thus underscoring the need for a data handling and reporting system which identifies erroneous data before it becomes part of the data base and is used in major decisions.]

ENCLOSURE II

STATUS OF NAMS NETWORK

(June 1, 1982)

	Number of Monitors	Percent of Planned Network
Total Number of Monitors Planned*	1266	--
Monitors Using Unacceptable or Uncertified Equipment	0	0%
Monitors not Meeting Mandated Siting Criteria	0	0%
Monitors not Operational**	20	2%
Monitors in Operation Meeting all Technical Requirements of a Mandated Quality Assurance Program	1204	95%
Monitors in Operation Meeting all Requirements of 40 CFR Part 58	1204	95%

* Includes SO₂, TSP, 1/ NO₂, CO, O₂

** 5 of these are presently undergoing relocation due to loss of site lease, destruction of present building or because local changes in its environment have caused it to no longer meet the siting criteria.

1/Particulate matter.

[GAO Comment: As explained on pages 13 and 14, we do not agree that monitors operating under a conditionally approved quality assurance program have met all technical requirements to fully implement the mandated quality assurance program and should not be included in the category "Monitors in Operation Meeting all Technical Requirements of a Mandated Quality Assurance Program." Therefore, as of June 1, 1982, 928 monitors, or 73 percent of the NAMS network, met all of the requirements of 40 CFR Part 58.]

ENCLOSURE III

STATUS OF SLAMS NETWORK

(June 1, 1982)

	Number of Monitors	Percent of Planned Network
Total Number of Monitors Planned*	3754	--
Monitors Using Unacceptable or Uncertified Equipment	8	0.2%
Monitors not Meeting Mandated Siting Criteria	419	11%
Monitors not Operational	220	6%
Monitors in Operation Meeting all Technical Requirements of a Mandated Quality Assurance Program	2510	67%
Monitors in Operation Meeting all Requirements of 40 CFR Part 58	2269	60%

* Includes SO₂, TSP, 1/ NO₂, CO, and O₂

1/Particulate matter.

[GAO Comment: As explained on pages 13 and 14, we do not agree that monitors operating under a conditionally approved quality assurance program have met all technical requirements to fully implement the mandated quality assurance program and should not be included in the category "Monitors in Operation Meeting all Technical Requirements of a Mandated Quality Assurance Program." Therefore, as of June 1, 1982, 1,423 monitors, or 38 percent of the SLAMS network, met all of the requirements of 40 CFR Part 58.]

ENCLOSURE IV

STATUS OF SLAMS QA REPORTS

Region	Current Number of Reporting Organizations	1981 Reports			
		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
1	6	6	6	6	6
2	3	3	3	3	3
3	17	17	16	17	17
4	33	33	32	33	33
5	33	32	32	32	26
6	16	14	16	15	14
7	11	11	8	9	9
8	8	8	8	8	8
9	10	10	10	10	10
10	4	2	2	2	4
Totals	141	136	133	136	130
Percent		96%	94%	96%	92%

[GAO Comment: See pages 36 and 37 for our comments concerning the accuracy of this table.]

ENCLOSURE V

PERCENT OF AGENCIES REPORTING MEAN ACCURACY
 WITHIN THE GIVEN INTERVALS

<u>Pollutant</u>	<u>True Value + 10%</u>	<u>True Value + 15%</u>
Total Suspended Particulate <u>1/</u>	98	99
Sulfur Dioxide	88	97
Carbon Monoxide	97	99
Ozone	96	99
Nitrogen Dioxide	83	92

1/Particulate matter.

[GAO Comment: See pages 36 and 37 for our comments concerning the accuracy of this table.]

(089173)



23095

AN EQUAL OPPORTUNITY EMPLOYER

**UNITED STATES
GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548**

**OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300**

**POSTAGE AND FEES PAID
U. S. GENERAL ACCOUNTING OFFICE**



THIRD CLASS