

OFFICE OF AIR QUALITY PLANNING AND STANDARDS  
AIR MONITORING STRATEGY FOR CRITERIA POLLUTANTS  
1986 UPDATE

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AIR MONITORING STRATEGY FOR CRITERIA POLLUTANTS

1964 UPDATE

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## INTRODUCTION

The EPA Policy on ambient air monitoring requires the Agency to develop ambient air monitoring plans and programs that meet the full range of present and projected data needs to support regulatory programs. This 1986 Strategy represents an update to: the OAQPS 1977 "Air Monitoring Strategy for State Implementation Plans" which served as the basis for developing Federal, State, and agency local long-range air monitoring programs; and the 1984 "Air Monitoring Strategy for Criteria Pollutants" which revised and updated the 1977 strategy. The 1984 strategy for ambient air monitoring for criteria pollutants addressed six activities: monitoring program objectives and data needs; air quality monitoring and data reporting regulations; monitoring compliance status - meeting data needs; methods development and evaluation; data storage, retrieval, and analysis; and program management review, evaluation, and revision.

This update highlights significant changes in program activities as well as successes achieved over the past 12 months. The report consists of three sections; the first describes major program changes that have occurred since the 1985 strategy update, and provides a summary of their present status; the second presents new areas needing improvement, and gives the status of programs identified as needing improvement in the 1985 strategy update; while the third cover lower priority activities.

### I. SUBSTANTIVE CHANGES

This section is divided into two parts, the major changes that have occurred since the 1985 updated strategy and the status of the changes that were identified as being needed in the 1985 strategy.

#### A. Changes Since the 1985 Strategy

##### 1. Non-Methane Organic Compounds

A new method of measuring ambient concentrations of non-methane organic compounds (NMOC) has been developed and tested in field studies during the summers of 1984 and 1985 in some 20 urban areas. Results from these studies show the new method to be much more reliable and accurate than the procedures used by most State and local agencies in the past.

Ambient NMOC concentrations are needed as input to models used for preparing ozone State implementation plans (SIP). There has been some question about the reliability of the output from these models when NMOC data from conventional monitors were used. The new procedure agrees very well with data from gas chromatographic (GC) methods, which are the most accurate available -- thus modeling predictions using the new procedure are thought to be correspondingly more accurate.

Because of the extensive quality assurance programs carried out during the 1984 and 1985 studies, OAQPS feels confident of the accuracy of the new method. Accordingly, OAQPS has notified the States that modeling predictions using data from the older NMOC monitoring procedures will no longer be acceptable in ozone SIP's unless the State can show that these data agree with GC data.

Another field study using the new procedure is being carried out in 16 cities again in 1986.

## 2. Generic Revisions

On March 19, 1986, generic revisions to Part 58 of Chapter 1 of Title 40 of the Code of Federal regulations were made for ambient air monitoring regulations for all criteria pollutants. These changes were identified by State and local air pollution control agencies through the Standing Air Monitoring Work Group (SAMWG) and through the individual operating experience of State and local agencies and the EPA over the last 5 years. The revisions were proposed on March 8, 1985 and include provisions to: use the most current census population figures to estimate air monitoring network size; allow 120 days instead of 90 days to submit National Air Monitoring Stations (NAMS) quarterly data to the National Aerometric Data Bank (NADB); require reporting organizations to submit the results of each individual precision and accuracy test; and modify network design and siting requirements.

## 3. Visibility Monitoring Activities

### (a) Interagency Program

In July 1985, representatives of the Federal Land Managers (FLM's) and EPA met and drafted goals and an administrative approach for an expanded formal interagency visibility monitoring program based on the "Visibility Monitoring Plan for Class I Areas" prepared in 1985 by Environmental Monitoring Systems Laboratory (EMSL-Las Vegas) for the Office of Air Quality Planning and Standards (OAQPS). The title of this program is "Interagency Monitoring of Protected Visual Environments" (IMPROVE), and it is administered by a technical steering group composed of one representative from each of the following agencies: Bureau of Land Management (BLM), U. S. Forest Service (FS), U.S. Fish and Wildlife Service (FWS), National Park Service (NPS), and EPA. Participating agencies signed a Memorandum of Understanding (MOU) which includes the general goals and approach of the IMPROVE program. Transfer of funds and other specific interagency activities will be covered under new or existing interagency agreements.

### (b) Visibility Improvement Source/Attribution Monitoring Program

The Visibility Monitoring Plan referred to in the 1985 strategy

update identified two major purposes of a visibility monitoring plan. One is to determine the background visibility conditions in and around mandatory Class I areas and the other is to document the extent of any visibility impairment in Class I areas that can be attributed to a source or group of sources. Last year's strategy update addressed a monitoring program to measure background visibility but did not include plans for a source attribution monitoring program.

A pilot study has been designed by the NPS for IMPROVE to develop the methodology and demonstrate the effectiveness of the documentation and attribution phases of a study to investigate suspected existing impairment in the Grand Canyon, Bryce Canyon area. This study is expected to cost between \$800K and \$1300K depending on the sampling frequency (every third day vs. every day) and the duration (1-2 months during the summer and winter seasons). Funds for the program, however, have not been committed by EPA or NPS.

## B. Status of 1985 Activities Listed Under Substantive Changes

### 1. State Implementation Plans for Visibility

On October 23, 1984, EPA proposed regulations requiring a visibility monitoring strategy and a visibility protection program for 34 States unless they submitted revised SIP's which would provide for visibility protection in mandatory Class I federal areas by May 6, 1985. On July 12, 1985, EPA disapproved the SIP's of and promulgated Federal regulations for those States that failed to act by the May deadline. These actions included the disapproval of 19 State SIP's for failing to meet the visibility monitoring requirements and 16 State SIP's for failing to meet the visibility new source review requirements. Since July, nine States submitted strategies which were approved by EPA.

### 2. Western and Eastern Visibility Networks

Areas for the first 20 visibility monitoring sites in the Western network have been identified and a priority rating has been assigned for the next 17 sites. A Federal register notice of these sites is planned for June 1986. Final selections will be made after review and consideration of public comments. EPA has transferred \$479K of FY-86 State program grant funds to the NPS for management of the contract for operating the Western network.

EPA (EMSL-LV) and the NPS are cooperating in a two-phase program (monitoring standardization, and development of advanced monitoring techniques) to improve and, where possible, standardize the monitoring technology for a visibility protection program. Performance specifications, rather than the identification of specific standard reference methods, was selected as the approach for standardization. A total of \$374K (\$204K EPA and \$170K NPS) through FY-86 are planned for this development and standardization program.

For F-87, a total of \$240K are planned, to be evenly split between EPA and NPS.

Plans for the Eastern United States Visibility Protection and Fine Particle Monitoring Network are on schedule. Fiscal Year 86 ORD (EMSL-RTP) resources of \$300K have been appropriated, and the sites which are to be collocated with the dry deposition monitoring program (DDMP) sites are being established as the dry deposition sties come on line: to date, five of the ten selected sites are operative. Approximately \$300K of ORD funds are planned for this project in FY-87.

### 3. PM10 Monitoring

Revisions to the particulate matter standard, the monitoring and reporting regulations and the regulations for implementing revised particulate matter standards were proposed in 1984. These actions resulted in a need for samplers to provide PM10 rather than TSP data to make attainment-nonattainment PM10 decisions for SIP development. As of March 31, 1986, a total of 771 PM10 samplers were in operation; this is 59 percent of the estimated 1300 PM10 samplers necessary for the SLAMS/NAMS network and an increase of 447 samplers since the 1985 strategy update. This network of 1300 PM10 samplers was revised from last year's estimate of 1930 by using the 1982-84 TSP data base as opposed to the 1980-82 base. By the end of FY-86, a total of 875 PM10 samplers or 67 percent of the total network are expected to be on line.

Grant funding of \$400K in FY-87 will allow State and local agencies to acquire approximately 115 samplers. Approximately 65 of these 115 samplers would address the unmet needs in areas with a 0.95 or higher nonattainment probability, while the remaining 50 samplers would be used to satisfy some of the unmet needs in areas having a nonattainment probability from 0.50 to 0.95. Additional purchases of 310 samplers by State and local agencies would be needed to achieve 100 percent of the estimated total needed.

## II. MONITORING AREAS REQUIRING IMPROVEMENT

### A. Since the 1985 Update

#### 1. Use of PM10 Data

At the time revisions were proposed for the particulate matter standard, there were very few PM10 sites available to determine whether an area was attaining the proposed PM10 standards. As a result, probabilities of nonattainment based on TSP were prescribed for use in the absence of PM10 data.

Now that large numbers of PM10 sites are in operation (470 sites), efforts are needed to ensure that data from these sites are submitted to the National Aerometric Data Bank. It is estimated that

currently only about 45 percent of these sites submit data. Notices have been sent from MDAD to the Regions requesting their assistance in increasing efforts to obtain the PM10 data.

## 2. SO2 Monitoring

A comprehensive review of the SO2 network will be needed in the event that the Agency should promulgate a 1-hour SO2 standard. Preliminary analyses indicate that the monitors may need to be relocated and some point source monitoring may be required. If a decision for requiring point source ambient monitoring is made, an increase in the number of monitors could be significant.

### B. Status of 1985 Activities Listed as Requiring Improvement

#### 1. AIRS

The National Air Data ranch is in the process of developing the Aerometric Information Retrieval System (AIRS) to replace the existing widely used OAQPS data systems for processing ambient and source information. The scheduled production data for the Air Quality subsystem of AIRS is March 1987.

AIRS will replace the three existing data systems (Aerometric and Emissions Reporting System (AERS), Comprehensive Data Handling System (CDHS, and Compliance Data system (CDS)) supported by OAQPS.

AIRS is divided into three subsystems for development and implementation, the Geographic/Common Subsystem, the Air Quality Subsystem, and the Facility Subsystem. The Geographic/Common Subsystem will contain all the geographic codes and other descriptive codes utilized by both the Air Quality and Facility Subsystems. The Air Quality Subsystem will contain data currently stored in the AERS, which includes air toxic data as well as trace element data from the National particulate Network. The facility Subsystem will contain data currently stored in NEDS and CDS as well as other data to be determined later.

The geographic/Common subsystem will be completed first since it is required by the other subsystems. The volume of data for updates for this subsystem is expected to be low. This subsystem will provide several retrieval programs to list codes for data input and analysis. The Geographic/Common and Air Quality Subsystems will be made available to the user community at the same time while the Facility Subsystem will be developed at a later date.

#### 2. Instrument replacement

As a means of assisting in the replacement of obsolete and/or worn-out ambient O3 and CO air monitors, the Agency allocated

\$2 million in FY-86 Section 105 grant funds for this purpose. A total of 248 monitors, 124 for each pollutant, have been targeted for procurement in FY-86. As of March 31, 1986, 21 of the O<sub>3</sub> monitors had been purchased and no CO analyzers. For FY87, grant funds of \$500K are planned. In order to maintain a high quality monitoring program, approximately \$1.5 million annually is considered necessary to replace obsolete or worn-out equipment.

### III. REVIEW OF PROGRAM PRIORITIES

Review and evaluation of the current ambient air monitoring program indicate that there are no major program activities that could take large budget reductions without seriously compromising their effectiveness. By regulation, the Regional Offices must review and approve each State's monitoring plan annually. These reviews have resulted in a decrease of some 50 percent of the number of monitoring sites (9000 vs. 4500) in the last 8 years, with little reduction occurring in the last 3 years.

This monitoring program has now matured and little change in the total number of monitors is foreseen in the next few years with the exception of TSP samplers. With the promulgation of the PM<sub>10</sub> NAAQS, and provided TSP does not become the basis for a secondary NAAQS, a net reduction of approximately 1000 particulate samplers should take place (2300 TSP to 1300 PM<sub>10</sub>). However, as it is more costly to operate the PM<sub>10</sub> samplers, there will be little, if any, monetary gain from this reduction. Another area that could undergo a decrease in the number of monitors operating is SO<sub>2</sub>. However, any reduction is clouded by the possible revision to the SO<sub>2</sub> NAAQS, to include a 1-hour standard. A 1-hour standard would probably result in the need for additional SO<sub>2</sub> monitors, particularly around large point sources; therefore, any decrease in SO<sub>2</sub> monitors would be temporary and not particularly cost effective.

Slight reductions in CO, Pb, and NO<sub>2</sub> monitors may be achieved through the annual Regional Office/State monitoring program review, but any saving will probably be lost through the need to increase O<sub>3</sub>, NMOC, and NO/NO<sub>2</sub> monitoring in ozone nonattainment areas.

OAQPS will issue a guideline on how to make the SLAMS network more cost effective in the near future. This document should assist the Regional Offices and States in the review of the States' monitoring programs and hopefully result in some cost savings; however, it is not believed that such savings will be significant.

The need to complete the PM<sub>10</sub> monitoring network, the expansion of O<sub>3</sub> monitoring, and need for additional NMOC/NO<sub>x</sub> monitoring, and the establishment of a national visibility network will require additional funds for monitoring, particularly at the State level. Therefore, no significant reductions in the ambient monitoring budget are believed to be possible, unless major changes are made to the regulatory program which monitoring serves.