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

SEP 12 2002

THE ADMINISTRATOR

Dr. Philip Hopke
Chair, Clean Air Scientific Advisory Committee
Science Advisory Board
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

Dear Dr. Hopke:

Thank you for writing on behalf of the Clean Air Scientific Advisory Committee to communicate the Subcommittee on Particle Monitoring's review (EPA-SAB-CASAC-LTR-02-001) of the U.S. Environmental Protection Agency's draft *Continuous Monitoring Implementation Plan*.

Please convey to the members of CASAC and the Subcommittee the Agency's thanks for their comments and recommendations, which will help to improve our use of new monitoring technologies in the air program. I am enclosing EPA's response to the Subcommittee's review.

EPA is already taking steps to incorporate the Subcommittee's comments and recommendations into the next iteration of our Continuous Monitoring Implementation Plan, and we look forward to enhancing the ambient air monitoring network with these improved technologies.

Again, my thanks to you and to your colleagues on CASAC.

Sincerely yours,

/ Signed /

Christine Todd Whitman

Enclosure

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EPA Staff Response to the Clean Air Science Advisory Committee (CASAC) Technical Subcommittee on Particle Monitoring

This letter provides a response to the CASAC letter of March 1, 2002 (EPA-SAB-CASAC-LTR-02-001), which reviewed EPA's draft *Continuous Monitoring Implementation Plan*. The review was based on a meeting with EPA in January 2002 at which EPA presented details of the plan. The meeting was open to the public, and other presenters also had an opportunity to provide input to CASAC.

The CASAC letter stated: "After discussion between the Subcommittee, the Office of Air Quality Planning and Standards (OAQPS) staff, and others present at the meeting, we (CASAC's Technical Subcommittee on Particle Monitoring) agreed that the document presented a reasonable framework for the use of continuous monitors." In addition, there were several comments and recommendations made in the letter from CASAC. The next iteration of the continuous monitoring implementation plan (Revision 2) has been edited to address each of these comments or recommendations. A summary of each comment or recommendation and a response is provided below:

Responses to Comments and Recommendations:

a. The Subcommittee is concerned that the process, as currently outlined, puts a heavy burden on State or local air quality agencies to demonstrate the Regional Equivalent Method (REM). This effort may be insurmountable for many such organizations. Normally, the burden for equivalency demonstration is the responsibility of equipment manufacturers, and the REM approach shifts that effort to the state or local monitoring agency.

We will encourage collaboration between equipment manufacturers and monitoring agencies; however, we recognize that much of the burden for this approach will fall on the state or local monitoring agencies.

b. There are other key issues regarding the regional approach that are difficult to resolve, such as the definition of appropriate regional domains, and the potential for atmospheric changes of such domains over time.

Since defining an appropriate regional domain may be impractical due to the dynamics of changing aerosol concentration and composition, a simplified approach to defining a regional domain will be made. Selection of regional domains will be made based upon a simplified approach of starting with a state network. If necessary, a sub-set of a state network may be approved where there are areas of acceptable performance of the continuous monitor, or multiple states may seek approval of a method in a coordinated effort.

c. The REM process only permits a simple model to convert the continuous monitor data into values that would be defined as equivalent to the Federal Reference Method (FRM) values. The model must be of the form: FRM = a * CM + b, where FRM is the estimated FRM 24-hour mass concentration in $\mu g/m^3$, CM is the measured 24-hour mass concentration ($\mu g/m^3$) estimated from the 24 one-hour values, and a and b are empirical coefficients developed from measurements within a region. The Subcommittee expressed the hope that it may be possible to develop a similar semi-empirical model, based on physical/chemical principles, that would provide adequate fits to the FRM data.

The continuous monitoring implementation plan will be edited to include semi-empirical models to allow for multiple physical/chemical parameters, so long as there is an appropriate system in place for assuring the quality of these additional parameters. For instance, ambient temperature is readily available on most continuous monitors as it is used for active flow control of the flow rate system. Since ambient temperature is already a part of most continuous monitoring methods, it is checked on a regular basis against a known independent standard. Other considerations have also been made such as inclusion of Julian date or utilizing two models with a breakpoint at a specific temperature.

d. The Subcommittee expressed the opinion that the current requirements for the REM designation are inadequate, in that they do not require a sufficient correlation between the FRM and CM data. The subcommittee recommended that, in addition to the requirements set out in the draft document, there be a requirement that the squared correlation coefficient (r^2) should be relatively high with the value set by an appropriate Data Quality Objectives (DQO) process.

Initial identification of an appropriate correlation coefficient has been made. A statistical analysis was performed which tests if true underlying correlations for each category of $PM_{2.5}$ continuous monitors are at or below a certain level. For a Correlated Acceptable Continuous (CAC) monitor category, a true underlying correlation less than or equal to the square root of 0.7 was chosen. For a REM, a true underlying correlation less than or equal to the square root of 0.8 was chosen. These true underlying correlations are based upon an iterative process of evaluating the error rates and sample sizes needed for reasonable observed correlations. Sample sizes were tied to sample frequencies of collocated FRM's, which are typically 1-in-6-day and 1-in-3-day. Based upon this analysis, the minimum observed correlation necessary for a CAC monitor was determined to be 0.9 (squared correlation of 0.81) with at least 44 sample pairs spread over a year. For a REM, a minimum observed correlation of 0.93 (squared correlation of 0.87) with at least 96 sample pairs spread over a year was determined.

e. The issue of monitoring for attainment of the 24-hour standard has not been addressed. Although the Subcommittee understands that the annual average standard will be the controlling standard, it is necessary to ascertain attainment or nonattainment of the 24-hour standard.

EPA has developed a software tool that helps to address decisions for the 24-hour standard. This software tool uses a series of power curves to help monitoring organizations determine the potential for decisions errors at $PM_{2.5}$ monitoring sites. The power curves for a 98^{th} percentile decision over three years demonstrates that higher sampling frequencies result in reduced decisions errors. This is especially important for potential use of PM continuous monitors in that these monitors will be delivering data each day. Increasing measurement precision has little effect on decision errors for the 24-hour standard.

f. Because of some of the difficulties anticipated in the implementation of the REM approach, the Subcommittee suggested an interim approach in order to begin moving continuous monitors into the network while the details of the REM process are being developed.

EPA has edited the continuous monitoring implementation plan to include a site REM that would serve as the interim approach identified by CASAC when used for National Ambient Air Quality Standards determinations. This approach would allow for sample frequency relief, and each year, if needed, a best-fit function would be reset in a prospective mode. The continuous data could be used for comparison to both the annual and the 24-hour standard. If the continuous data were to be invalidated at a specific site for not meeting pre-determined performance criteria, the FRM data would be available for attainment decisions.

g. The Subcommittee recommends that EPA undertake a thorough DQO process to determine the needs for monitors so that Federal Equivalent Method requirements can be defined based on a clearly defined set of data quality needs.

EPA is planning to undertake this DQO exercise later this summer. Details of the results are expected later this year.