UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
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OFFICE OF
THE ADMINISTRATOR

Mrs. Anne M. Gorsuch
Administrator
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Dear Mrs. Gorsuch:

The Clean Air Scientific Advisory Committee (CASAC) recently reviewed the Office of Research and Development's (ORD) program to support criteria pollutant research for Gases and Particles (GAP) and has prepared recommendations for improving that research program. The major pollutants reviewed were particulate matter and sulfur dioxide. CASAC's review stemmed from its evaluation of the Air Quality Criteria Document for Sulfur Oxides/Particulates (SO_x/PM) which led to the identification of significant information needs relative to standard setting for these pollutants. The Committee recognizes that in the past decade new data bases useful for standard setting for sulfur oxides and particulates have been developed. For example, the understanding of particulate matter has evolved to such an extent that re-directing control of particulates to a size cut smaller than Total Suspended Particulates represents a reasonable and scientifically defensible public health policy choice.

At the same time, the last decade in air pollution research has been a period of many missed opportunities. During the review of the Air Quality Criteria Document for SO_x/PM it became apparent that much of the data base for these pollutants comprised the same set of information upon which the original standards for these pollutants were based. At a time when the Agency is considering significant revisions to the existing standards for these pollutants it is faced with serious gaps in the scientific literature. This is especially true for epidemiological studies for sulfur dioxide and for particulates where some of the most reliable data were developed in Great Britain over twenty years ago. Given the tremendous differences in contemporary American particulate exposures compared with conditions existing in Britain at that time, there is a great need to gather and interpret up to date American epidemiological data. The more dated the epidemiological data sets, the greater is the need for more complete information for use in the next five year cycle of standard setting.

CASAC addressed four components of the Gases and Particles research program. These included control technology, environmental processes and effects, health effects, and monitoring. The Committee concluded that development of monitoring and control technology systems had made appropriate progress in recent years. Important gaps in pollutant modelling and in understanding pollutant contributions to welfare effects remain. However, the research area in GAP most in need of development and support is health effects.

In general, EPA's health effects research program for Gases and Particles is unbalanced. A balanced research program to support primary ambient standards development can be compared to a stool that requires three legs to maintain an upright position. The three legs of a research program for primary ambient standards consists of 1) controlled exposures of human volunteers, 2) in vitro and in vivo laboratory experiments, and 3) epidemiology. These three legs must be kept in balance. Both human clinical and animal toxicological research have been supported with resources sufficient to maintain a viable program in the period of limited resources of the past few years. The research productivity of the Health Effects Research Laboratory's (HERL) animal inhalation program enjoys a particular reputation for scientific excellence. Among the human clinical and animal toxicological research needs identified, CASAC recommends that a higher priority be assigned to aerosols and to combinations of gases and particles. Further work is needed in evaluating the short-term response of asthmatics and other sensitive groups. Both the Office of Research and Development (ORD) and the Office of Air Quality Planning and Standards (OAQPS) should develop a plan to identify which issues are to be studied and which health endpoints are to be investigated.

It seems that EPA's epidemiological research program has yet to recover from the fallout associated with Congressional and other investigations of the Community Health and Environmental Surveillance System (CHESS). Similarly, it is clear that EPA-HERL will not soon re-establish a major in-house epidemiological research program to evaluate pollutants such as sulfur oxides and particulates. The support of epidemiology, however, is a key part of EPA's research mission.

Alternatives to the development of a costly in-house epidemiological program already exist. The Agency's partial support of the Harvard Six Cities studies, and its sponsorship of the University of Pittsburgh's Center of Excellence, are

examples of effective means of generating epidemiological data needed by the Agency. The development of well defined and well managed cooperative agreements between extramural contractors and EPA provides a mechanism whereby the quality of research can be optimized.

EPA should support more extramural epidemiological research. This could best be done by maintaining a small scientific group within the agency that can: 1) establish needs for epidemiological data in consultation with the OAQPS and ORD scientists and managers; 2) prepare and issue requests for research applications addressed to the Agency's need for population response data; and 3) arrange for appropriate peer review of the research applications received.

Such an epidemiological program should receive a fair share of the GAP research budget in relation to the Agency's regulatory information needs. The Agency should also place more of an emphasis on epidemiological research as a means of developing a more balanced health effects research program.

Another important aspect of a balanced health effects research program is long-range research that goes beyond immediate regulatory needs and identifies new and emerging health related issues. Up until FY-83, these needs have been effectively addressed by EPA's extramural grants program, which has funded peer reviewed unsolicited research proposals. CASAC is particularly concerned about the lack of funds for new grants in FY-83.

CASAC also reviewed the GAP program for its adequacy in planning and supporting research related to environmental processes and effects. It identified three broad areas of research needed to support standard setting. They include: 1) Modelling. More source - receptor oriented relationship modelling is needed for individual pollutants and for certain easily quantified pollutant effects such as light extinction as related to visibility. 2) Assessment of Agricultural Losses from Air Pollutants. An excellent program, NCLAN (National Crop Loss Assessment Network) is underway and should receive continued support. More emphasis should be placed on research involving interactions of ozone and other pollutants and with other stresses such as temperature, soil moisture, and relative humidity. 3) Effects of Air Pollution on Timber and National Ecosystems. A program to determine biomass losses both to commercial production and natural ecosystems has been started. The approach is sound, the

data should be highly valuable, and CASAC urges continuance of this program. Correlated with ambient air quality conditions each year, the program should generate some results useful for setting standards.

In summary, the Committee is concerned that many of the most important research needs related to sulfur oxides and particulate matter are not being met, particularly in the area of health effects research. This factor will delay the resolution of major scientific disputes that arise during the standard setting process. The Committee hopes that its recommendations will prove useful to both you and the Congress during the course of developing the GAP research budget for Fiscal Year 1984.

Sincerely yours,

Bernard D. Goldstein, Chairman
Clean Air Scientific Advisory
Committee