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

EPA-SAB-Letter-90-002

April 20, 1990

OFFICE OF
THE ADMINISTRATOR

Honorable William K. Reilly
Administrator
U.S. Environmental Protection
Agency
401 M Street, S.W.
Washington, D.C. 20460

Dear Mr. Reilly:

The Radon Gas and Indoor Air Quality Research Act of 1986 (Title IV of SARA) mandated that the Administrator establish an advisory committee to assist him in carrying out the research program for radon gas and indoor air quality. The Act also identified a broad design for the research program and set certain reporting requirements. In addition, the Act specifically required that the Science Advisory Board (SAB) review and provide comments to the Congress on the Agency's Indoor Air Quality Implementation Plan. To meet these advisory requirements, the Science Advisory Board established the Indoor Air Quality and Total Human Exposure Committee as a standing committee of the Board.

On behalf of the Indoor Air Quality and Total Human Exposure Committee, we would like to call your attention to some serious concerns we have about the extremely limited role the Committee has been able to play in advising both you and the Congress in its mandated role under the Act. From its first meeting in November 1987, the Committee has sought guidance on the extent of its responsibilities. We remain uncertain whether the Committee should exercise oversight over the whole range of Federal research on indoor air quality, or only on EPA's relatively modest component of the whole. The former is a formidable task, but the latter is also difficult since EPA's own program can duplicate other research or fail to focus on critical knowledge gaps. We believe the Committee can serve both EPA and the larger Federal research program on indoor air issues by examining the total research effort, including critical gaps not being effectively addressed by any agency; possible duplication of effort by the individual programs; and the extent to which ongoing research is well-targeted and executed. We are not the only ones who think so. On several

occasions, Dr. Paul A. Cammer, on behalf of the Business Council on Indoor Air (BCIA) has written to the Agency with essentially the same suggestion.

In the absence of authorization to pursue a larger role, the Committee has only been active in its more limited role as advisor on EPA's own program. As a result, the Committee has met only twice since it was formed in early 1987. The first meeting, on November 19-20, 1987, was held for the purpose of reviewing the Agency's Indoor Air Quality Implementation Plan. The second meeting, on March 28-29, 1989, was held for the purpose of reviewing the Agency's Indoor Air Quality Research Needs Statement. It has now been over a year since the Committee met or had the opportunity to provide advice to the Agency or to the Congress. In part, this has been due to the severe budgetary constraints under which the Science Advisory Board operates, restricting both meeting opportunities and staff support.

At least one major indoor air initiative (i.e. asbestos in schools) was undertaken by EPA without benefit of the advice of our Committee or of other advisory committees within the SAB. The scientific basis for the actions taken by EPA was not as thoroughly developed as those that have received review by your external scientific advisors. Substantial and legitimate scientific concerns that were subsequently expressed about the wisdom of EPA actions might well have been forestalled or ameliorated had such advice been sought. For example, recent papers in the New England Journal of Medicine (320:1721, 1989) and Science (247:294, 1990) examined the nature and magnitude of health risks from the inhalation of asbestos in relation to EPA's rules under AHERA. It was shown that the risk estimates were based on human experience with the more toxic kinds of asbestos that account for less than 5% of the asbestos in place in U.S. buildings. Furthermore, the rules have led to removal decisions and procedures which have frequently increased rather than decreased human exposures. In a highly critical editorial in the March 2, 1990 issue of Science, Dr. Philip H. Abelson concluded that EPA's actions had reduced its credibility.

We also call your attention to the attached letter of March 22, 1990 from the SAB's Environmental Engineering Committee (EEC) concerning asbestos. Its conclusions and recommendations are clearly consistent with some of the concerns raised in the above

cited publications. This independently generated call for a Science Advisory Board advisory role in asbestos abatement technology led the SAB Executive Committee on April 9, 1990 to authorize the Indoor Air Quality and Total Human Exposure Committee to examine the Agency's various research and advisory activities on asbestos, such as health effects, air sampling, analyses, work practices of removal workers, abatement technology, target clean-up levels, etc. The Committee will conduct a planning session for the examination of these issues during one of its anticipated meetings this summer. These meetings will include our continuing review of the Agency's Total Human Exposure Program, and our review of the OHEA environmental tobacco smoke risk assessment.

We urge you to help us to serve you and the Congress more effectively. To help us do so, we request that you provide more explicit guidance on the extent of our responsibilities under the Radon Gas and Indoor Air Quality Research Act of 1986, especially whether the Committee should play a broader role of scientific oversight of the overall Federal program in indoor air research through collaboration with the CIAQ or through other appropriate mechanisms. The Committee remains available for providing scientific advice on specific issues of indoor air and total human exposure of concern to EPA, especially when regulatory or intervention initiatives are contemplated. The advice of our Committee is most useful prior to the undertaking of such initiatives. We look forward to continued interactions with you and members of your staff.

Very truly yours,

Raymond C. Loehr

Dr. Raymond Loehr, Chairman
Executive Committee
Science Advisory Board

Morton Lippmann

Dr. Morton Lippmann, Chairman
Indoor Air Quality and Total
Human Exposure Committee
Science Advisory Board

cc: Dr. Paul A. Cammer, BCIA

Enclosure

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

March 22, 1990

OFFICE OF
THE ADMINISTRATOR

Dr. Raymond C. Loehr
Chairman, Executive Committee
Science Advisory Board
Office of the Administrator
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dear Dr. Loehr:

SUBJECT: EEC Commentary on Asbestos Abatement Technology

Introduction

In December, 1989, The Environmental Engineering Committee had planned a review of the current engineering research on asbestos abatement. Before the meetings were held, an intra-agency review of priorities for the current year was held. One of the outcomes of this activity was a decision to cancel the asbestos research meeting and defer the review until some later time.

Preparing for that now-cancelled review had brought forth in the Committee a renewed insight into the current state of asbestos abatement technology and engineering. At the recent meeting of the Engineering Committee (February 27-28), the Committee as a whole discussed certain aspects of the issue and decided to address some observations on this subject to the Executive Committee. We are not currently in a position to recommend specific action by the Executive Committee or the Agency, but suggest that the technical basis of support of the current programs and activities is at best weak and uncertain and needs attention.

The widespread public concern about hazards of asbestos exposure and the high level of public expenditures contemplated for the abatement of those hazards should call for high priority on research in this area. Both Government and private sources suggest that an expenditure of $50 billion or more will be needed just to reduce hazards in public buildings and facilities in the next ten years, while private expenses may be several times that figure.

A key element in the picture is that, today every decision, public or private, to repair, renovate, or demolish any building in the country is made in an atmosphere of great uncertainty. Is there asbestos to be managed? How shall we accomplish it? What

will be the costs? How can the tort liabilities of such a situation be managed?

There are anecdotes in the industry about owners just walking away from buildings rather than try to deal with the problem of asbestos management. In the cities, no one knows the effect of these uncertainties on the deterioration of buildings. The recent steam explosion in a New York street, while it caused some damage and injuries, had its major effect when a large number of apartments were closed to their occupants for weeks, even months, while the authorities agonized over the need for asbestos cleanup action and the issues of responsibility for costs and liabilities.

Problems in Asbestos Abatement

Asbestos removal or isolation from populations are the choices for methods of reducing risks from exposure from all sources. Protection of asbestos-removal workers is based on the establishment and maintenance of physical barriers between the person and the material while applying water to the material in the expectation that this will limit its dispersal into the environment.

The problem with the methodological approach as defined in current Agency Guidance documents is that there is no solid technical or objective basis for the three key decisions in an actual isolation or removal project.

1. Deciding when actual exposures constitute significant health hazards which can be reduced by abatement action;

2. Deciding whether the removal is being conducted safely and without undue exposure of workers and public; and

3. Deciding when the work is finished--that is when the hazard that is intended to be reduced has actually been affected or reduced to some acceptable level.

The use of subjective standards like "damaged" or "friable" conditions which must be corrected, places school officials at a disadvantage in responding to public pressures. Most small and non-profit enterprises must rely on expensive consultants to decide their proper course of action, with no objective way of assessing their recommendations.

In removal operations, workers must work in conditions that are nearly unbearable, doing detailed hand work in barrier garments and wet, sloppy, often dangerous locations on ladders and scaffolds.

Environmental protection off site is poorly-controlled under a standard of "no visible emissions". Landfill disposal of wet asbestos-containing materials in suitable packaging is permitted

under most solid waste regulations, but landfill operators often do not accept the material because of a misperception of the hazards, and landfill space is rapidly becoming difficult to find.

Most projects are declared complete when the physical work is done to the best of the ability of the contractor. Assessment of the cleanup and the acceptability of the facility for use takes time, during which the contractor faces the problem of maintaining his work force with no work available or of losing that force when it may be necessary to replace them with less-experienced workers if more must be done to achieve the desired levels of exposure.

Research Needs

The present ORD engineering research in asbestos abatement is useful and may bear fruit in improved protection of building custodial personnel and others who do cleaning and maintenance in buildings where asbestos containing materials are present. The Environmental Engineering Committee wishes to be helpful to the ORD team working in this field as the need arises.

Extensive engineering research in this field is, however, unlikely to be justified until a more solid basic scientific foundation exists which the engineers can apply to the problem of asbestos abatement and related issues, such as cleaning and maintenance.

The most intense need for new scientific work seems to be in the area of analytical methods. Present methods, involving either phase-contrast microscopy or transmission electron microscopy, leave much to be desired as a basis for management of field operations or for evaluating the effectiveness of new technological means of control and abatement.

The two methods detect widely-different universes of small particles in the same samples. The electron microscope detects one or two orders of magnitude more particles in the microscope field, largely because it can resolve or "see" much smaller particles than can the optical phase-contrast scope. With either instrument, a well-trained operator and an experienced interpreter of the results is needed to arrive at a measure of the type and number of fibers found in the air originally sampled. This takes time. Clearly, analytical methods need to be developed which allow prompt measurement feedback on a real-time basis, as well as methods which have greater reliability in terms of replicable results by technicians, rather than highly skilled specialists as is currently the case.

Trying to conduct a cleanup in the field with no feedback on the results of the work for days or even weeks is unlikely to be very effective. More rapid analytical methods, even if only useful for relative concentrations which can be calibrated

against more reliable results from the electron microscope, would greatly facilitate field work. Such methods are also essential to the evaluation of effectiveness of new technologies for the management of the materials and therefore to the usefulness of engineering research and development in this field.

While no one questions the dangers of asbestos exposures of a magnitude and duration similar to those in occupational settings, there remains substantial uncertainty among workers in this field as to the hazards resulting from levels of exposure in the general environment and in occupied buildings.

This concern, common in all environmental control decisions, seems more of a problem in the case of asbestos. There are numerous anecdotes in the trade about removal projects which resulted in substantial increases in the concentration of asbestiform materials in the areas where people are exposed. Lack of confidence in the health-effects data--which may be the best that can be obtained--results in substantial controversy over the need for the abatement work in the first place and the decision as to when to stop the work as complete.

Conclusion

The current state of technology for the elimination of asbestos exposure in buildings and other environmental settings is primitive. Research and development of new engineering methods and approaches is badly needed in view of the complexity and costs to the public of the corrections needed as a result of the use of asbestos-containing materials over the past century.

The effectiveness of engineering research in this field depends on research that provides fundamental building-blocks which strengthen the scientific foundation for such research.

Included in the scientific areas required to make it feasible to undertake substantial improvements in engineering technology are health effects research to define the envelope of risks in exposures actually found in environmental settings; and in analytical methods which allow real-time assessment of results and the ability to achieve cleanup levels which are protective of human health in this field.

It is recognized that the areas of research suggested in this letter are not within the usual scope of the assignment of the Environmental Engineering Committee. However, members of this Committee will be available in whatever way may be helpful in assessing and addressing the issues raised here. In similar ways, the Committee wishes to be of assistance to ORD in the development and execution of any plans for future engineering research and development activities.

In conclusion, we recommend that the Science Advisory Board respond positively to requests to review research in the asbestos

area and that the Indoor Air Quality/Total Human Exposure Committee take the lead with participation by an engineer and an analytical person.

Respectfully Submitted by:

J. William Haun
Member, Environmental
Engineering Committee

Endorsed By:

Richard A. Conway
Chairman, Environmental
Engineering Committee

cc: SAB Executive Committee
SAB Environmental Engineering Committee
SAB Indoor Air Quality/Total Human Exposure Committee
SAB Staff