



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C. 20460

April 21, 1992

OFFICE OF
THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

EPA-SAB-EEC-LTR-92-007

Honorable William K. Reilly
Administrator
U. S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

Subject: Science Advisory Board Letter Report on Review of ORD's Draft
"Pollution Prevention Research Strategic Plan"

Dear Mr. Reilly:

The Science Advisory Board (SAB) has completed its review of the Office of Research and Development's (ORD) "Pollution Prevention Research Strategic Plan" (March 1991 draft), and is pleased to submit this letter report. On April 11 and 12, 1991, the Pollution Prevention Subcommittee (PPS) of the SAB's Environmental Engineering Committee (EEC) reviewed the draft document, received detailed briefings from its developers, considered technical arguments, and offered advice to the program office on this highly visible topic of interest to the EPA and outside parties. Since that time, we have shared various draft copies of a full report with ORD staff; these drafts provided extensive comments on the document submitted to us for review.

The following findings and recommendations were extracted from the PPS draft full report (which this letter report replaces) and are aimed at refocusing and improving the current Pollution Prevention Research Strategic Plan (hereafter referred to principally as the Strategic Plan).

Critical Program Findings/Recommendations

1. **Responsiveness.** We commend the Agency for attempting to develop a draft document that a) ties into the research requirements of the Pollution Prevention Act of 1990, b) builds on recommendations in the SAB's *Future Risk: Research Strategies For the 1990's* (EPA-SAB-EC-88-040, September, 1988) and *Reducing Risk: Setting Priorities and Strategies for Environmental Protection* (EPA-SAB-EC-90-21,

September, 1990 - hereafter referred as *Reducing Risk*) reports, which identify high risk environmental issues amenable to pollution prevention, c) presents generic research to address these issues, and d) describes proposed and current research projects. The SAB was pleased to have been asked to review this document at an early stage and to offer recommendations for improvement.

2. Strategic Planning Process. We are reluctant to refer to the document as a "strategic plan" because, as currently drafted, it does not contain all the elements commonly contained in a strategic plan: a vision, an assessment of the current state of knowledge, and a pathway by which one moves from the current state to realization of the vision. The document provides an informative assessment of pollution prevention research currently in progress at the Agency. Some mention is made of a pathway. A vision statement, however, is lacking. Without a clear expression of a vision, we are concerned that the research effort lacks focus, which could result in confusion. Once a vision is established, an optimal pathway can be selected, thereby maximizing the effective use of available resources. We urge the Agency to draft a strategic plan for pollution prevention founded upon a vision and containing an optimal pathway approach. With the strategic plan in place, the current document could be redrafted as a program plan which, in its current form, it most closely resembles.
3. Clarity/Conciseness. While comprehensiveness often is prudent for an early draft, the final document(s) need(s) to be much clearer and more concise to have major impact. Also, more citations are needed and acronyms and jargon need to be defined.
4. Risk/Research Selection. This overall prioritization of research activities is not consistent with those in the *Reducing Risk* report that was cited by the Agency as one of the guiding principles of the research strategy. For that matter, where there are common elements between the two, the rankings in the Strategic Plan are inconsistent with those identified by the SAB in its recent report on a Municipal Solid Waste (MSW) research review (*Review of the Office of Research and Development's Municipal Solid Waste Research Program EPA-SAB-EEC-91-009, May, 1991*). In addition, the draft document also states that those issues not ranked are addressed through other programs, yet no accounting is made of the "other programs". In view of these inconsistencies, it would be prudent to revisit and explain the ranking in some detail. It should be stressed that a high ranking on the SAB's list does not provide a compelling prima facie argument for expanding or extending research in that area. The Subcommittee is not saying that the current ranking is incorrect, just that a risk ranking is not a priority ranking in and of itself. Since ranking ultimately translates to resource allocation, the Subcommittee is suggesting that the ranking process be as objective as possible and well defined. The SAB Executive Committee

notes that the priorities in *Reducing Risk* and the research strategy for pollution prevention do not necessarily have to agree, and the prioritization procedure explained in the Strategic Plan could benefit in the future by periodically revisiting prioritization in a less ad hoc manner. The formation of a Pollution Prevention Research Council, such as is being considered for Social Science Research and Bioremediation Research, is one approach to do this.

5. Responsibility. The pollution prevention initiative is new and its structure is evolving, as is ORD's response to the initiative. Therefore, it is not surprising that areas of overlapping responsibility exist among the programs. We recommend that these be resolved quickly as the program matures and its leadership and coordination emerges. To the Agency's credit, the initiative does have a matrix manager in ORD's Office of Environmental Engineering and Technology Demonstration (OEETD).
6. Funding/Staffing. The Strategic Plan provides insufficient information regarding both funding and full-time equivalents (FTEs) to enable one to determine if adequate resources are available to achieve the stated objectives. In the absence of clear information on funding and FTEs, it is not possible to assess whether the strategy can be successfully implemented. In most endeavors, the funding and FTEs will be limited. Thus, a need exists to prioritize the limited resources to be used.
7. Pollution Management. Pollution prevention research will not eliminate the need for ongoing research in areas that serve to manage pollution. Pollution cannot be totally eliminated and there will be a continuing need for both pollution management and pollution prevention research. Therefore, initiatives in pollution prevention research should not be allowed to preclude OEETD's pollution management research activities.
8. Terminology. We recommend that ORD establish clear and consistent consensus terminology for pollution prevention in order to foster common goals and effective communication. Once this has been accomplished, the terminology must be clearly communicated both internally and externally to facilitate the implementation of the strategic plan and technology development as well as its application. The draft document is inconsistent, e.g., pollution prevention is defined at one point as not including recycle/reuse, yet such a definition is included in the research strategy. The SAB advises that recycle/reuse should be included in the pollution prevention research strategy.
9. Measurement. As the SAB stated previously in its review of the Agency's draft pollution prevention research plan report to Congress *Review of the ORD Draft Pollution Prevention Research Plan: Report to Congress EPA-SAB-EEC-89-037*,

September 1989), the EEC continues to be concerned about how the Agency will measure the success of pollution prevention actions and associated research efforts. The precision and accuracy of the information that is to be used to guide pollution prevention should be a paramount concern, and specific research needs to be targeted at that issue. While the 33/50 program and the Toxics Release Inventory (TRI) database are an appropriate start and a good example of the alternative strategic options called for by the SAB in its *Reducing Risk* report, they only partially address the problem. For example, important industries, such as mining and agriculture, are exempted from TRI reporting requirements, and accounts of environmental releases of radionuclides and pesticides are missing.

Specific Program Recommendations

10. **Treatment.** Reducing waste discharges and emissions by treatment is important, but it is not pollution prevention according to the current definition, and thus should not be included in the Strategic Plan.
11. **Global Climate.** The greenhouse gases/global climate portion of the Strategic Plan would benefit greatly from a convincing argument to support the magnitude of the expected effect of the stated conservation research strategy. The characterization of global climate change should be compared to the more extensive SAB reports on the topic (e.g., *Review of the Report to Congress: The Potential Effects of Global Climate Change on the United States EPA-SAB-EC-89-016, April 1989*, and *Review of the Report to Congress; Policy Options for Stabilizing Global Climate EPA-SAB-EC-89-034, September, 1989*). Better coordination on this issue should be sought with other activities, such as those of DOE and other entities external to the Agency.
12. **Pesticides.** The current program dealing with pesticides application is too small and narrowly focused on managing pesticide containers and partially utilized stocks. More substantive pollution prevention approaches into pesticide problems should consider research on non-chemical substitutions and more tightly restricted modifications of pesticide applications. This effort should be coordinated with the U.S. Department of Agriculture.
13. **Non-Point Sources.** Of importance to a pollution prevention research Strategic Plan would be an aggressive program to implement the most feasible pollution prevention technologies and approaches to non-point sources of water pollution. The non-point source water discharges section of the Strategic Plan is weak, lacking both a solid foundation and a clear sense of criteria for establishing priorities to conduct research

aimed at improving the knowledge base.

14. Hazardous Wastes. In response to public concern over the hazardous waste management problem, it is imperative that the Agency have a well considered and cohesive strategy. The Agency should take a facilitating role and continue to act as a clearing-house of information, but not develop technology by which each individual business, industry or facility would achieve pollution prevention, leaving that activity principally to the affected facilities and industries.
15. Consumer Products. The Strategic Plan's emphasis on consumer products appropriately reflects the growing recognition of these products as important diffuse sources of pollution and the role of consumer demand in reducing the environmental burdens associated with their production, use and disposal. The overall research package includes a balanced mix of technological and non-technological approaches. Life-cycle assessment (LCA) research is particularly important, but the LCA tool is still in the evolutionary phase and it needs to be recognized and articulated that considerably more research is needed before LCAs yield sound, practical, technical, and policy-oriented results. Also, the relationship between the potential projects is unclear and an overall strategy linking projects is needed.
16. Municipal Solid Waste. Consideration should be given to merging the Pollution Prevention elements of municipal solid waste and consumer products research areas. The Federal role is most appropriate in ensuring that waste generators, either individual or institutional, receive adequate incentives to reduce waste at the point of generation; hence, the importance for socioeconomic research on incentives and disincentives.
17. Social Science. The Strategic Plan lacks sufficient programs in the social science area, in relation to the opportunities. Therefore, the Subcommittee recommends that serious consideration be given to incorporating specific social science research activities into the Strategic Plan.
18. Communication. Encouragement should be given to projects which facilitate communication and technology transfer, particularly those projects which provide opportunities for integrating and transferring results from many of the complementary research areas. In addition, a number of specific projects are suggested, such as:
 - a) A school-based program on pollution prevention activities;
 - b) A building-based project dealing with indoor air pollutants;


- c) Estuary, lake, or wetland projects that might be organized on both an individual and a community level; and
 - d) Social science projects which examine how to identify and deal with learning and cultural barriers to implementing pollution prevention.
19. **Other Projects.** Other research projects are proposed by the Subcommittee for Agency consideration. They are briefly described as follows:
- a) The Strategic Plan discussion inadvertently suggests that it is known what "clean" (or even "cleaner") products are, and that simply getting the data out to consumers will solve the problem. An extremely important research element would be to attempt to identify those characteristics of products that are particularly desirable or undesirable, i.e., to devise objectives for clean-product research.
 - b) The Agency should consider research on broadening its perspective and shifting the focus from product categories to the function performed by a product. The current and proposed research may miss wholly different ways of achieving utility derived from a product use if problems are described too narrowly. Moreover, focusing on pollution reductions or other improvement measures per unit of product does not address other generic issues, such as overall levels of consumption. Several projects can be given as examples to achieve a broader perspective, such as toxic versus nontoxic cleaners for household use and toxic versus less toxic pesticides for yards and gardens.
 - c) Institutional consumers can play a major role in changing the specifications of various materials purchased, yet relatively little is known about their decision-making process. Case studies of institutional purchasing decisions could provide such information.
 - d) Several universities have altered their curricula to include pollution prevention emphasis and/or options. There is a need for continuing education programs for designers and engineers who are already in the work force. The Agency could facilitate this by developing environmental education programs for product designers and production engineers.
20. **Labeling.** There is substantial EPA-sponsored research on the effects of product labeling of hazardous consumer products. Adequate justification for including the consumer labeling project is not presented in the research plan. Such justification


should be either provided or the inclusion of the project reconsidered. The justification provided should also suggest how the labeling research projects should be designed.


21. Criteria Air Pollutants. The Strategic Plan does not appear to contain any new efforts in the area of criteria air pollutants. Current research on means to reduce volatile organic compound emissions from consumer products use appears to be well planned. However, means to transfer findings to the users needs to be addressed.
22. Transportation. Transportation planning should be included in the Strategic Plan. The Plan should be open to innovative ideas that may be more cost effective as well as acceptable to the public.
23. Halons. The halon research is well conceived. However, two of the proposed research areas (brominated dimethylfluoroethers as halon substitutes and alternatives to chlorofluorocarbons and methyl chloroform) might be better accommodated within the private sector.
24. Anticipatory Research. The Strategic Plan lacks a viable framework for preventing future pollution problems. Pollution prevention is proactive in principle, and more emphasis needs to be given to anticipatory research.

In summary, the Subcommittee believes that the Strategic Plan is a significant early step along the path to establishing Pollution Prevention as an Agency paradigm. We understand that ORD has already begun to respond to our recommendations for improvement of the ORD draft document, and look forward to your response.

Sincerely,


Raymond C. Loehr, Chair
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Science Advisory Board


Richard A. Conway, Chair
Environmental Engineering Committee
Science Advisory Board


Wayne M. Kachel, Chair
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