



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

October 13, 1983

OFFICE OF
THE ADMINISTRATOR

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

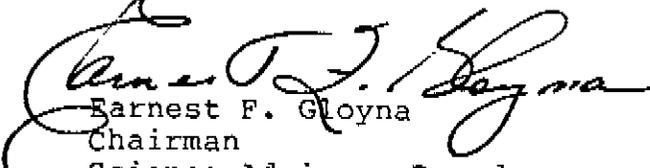
Dear Mr. Ruckelshaus:

The Environmental Health Committee of the Science Advisory Board has completed its review of a revised Draft Health Assessment Document for Acrylonitrile prepared by the Agency's Office of Research and Development. The major conclusion of the document was that, in combining the animal and human evidence, acrylonitrile would be placed in group 2A of the International Agency for Research on Cancer's (IARC) classification system. Using the IARC criteria acrylonitrile is characterized as probably carcinogenic in humans, where the evidence for human carcinogenicity is almost sufficient. The Committee concurs with this statement and concludes that the health assessment document is scientifically adequate for use in regulatory decision-making.

The revised Draft Health Assessment Document for Acrylonitrile has been reviewed by the Science Advisory Board on August 3 and December 9, 1982, and June 10, 1983. Agency staff have proven responsive to SAB requests for revisions, particularly in the development of a quantitative risk assessment. As a result, the Board is satisfied that the November 1982 draft document presents a thorough analysis of existing information concerning the sources of acrylonitrile in the environment and the consequences to animal and human populations of exposure to this pollutant.

Additional comments and recommendations are summarized in the attached report. The Environmental Health Committee appreciates the opportunity to provide its advice on this important issue.


Herschel E. Griffin
Chairman
Environmental Health Committee


Earnest F. Gloyna
Chairman
Science Advisory Board

Attachment

cc: Mr. Alvin Alm
Dr. Courtney Riordan
Dr. Terry F. Yosie

Environmental Health Committee Key Findings and
Conclusions on the Revised Draft Health
Assessment Document for Acrylonitrile (November 1982)

1. The chapters on air quality have been revised to incorporate more recently available data on acrylonitrile sources, emission estimates and ambient air concentrations based upon a comparison between monitoring data and data generated from air quality dispersion modeling. Such revisions are appropriate and present a more complete profile of acrylonitrile in the environment.

2. Acrylonitrile exposures to humans are associated with health effects such as irritation of the eyes and nose, central nervous system impairment and cancer. The carcinogenicity of acrylonitrile has been assessed in seven cancer bioassays in rats, and ten human epidemiological studies, published and unpublished, were discussed in the document. The Committee found the Agency's analyses of this information both balanced and thorough.

The findings of these studies related to cancer include a significantly increased risk of cancer of the stomach and of the lymph system and a statistically significant risk of lung cancer in the populations studied. Comparing these results with the criteria for carcinogenicity developed by the International Agency for Research on Cancer (IARC), the Agency concluded that the animal data presented "sufficient" evidence of carcinogenicity and the human data constituted "limited to

sufficient" evidence of carcinogenicity. Combining these two data sets, the document asserts that acrylonitrile should be classified as 2A, the category of the IARC criteria which reads "probably carcinogenic in humans, where the evidence for human carcinogenicity is almost sufficient." The Committee concurs with this assessment as well as the scientific rationale developed in the document to support it.

3. The section of the document that was vastly improved was the presentation of the quantitative information that addressed cancer risk. Several particular areas of improvement included:

- o clear presentation and discussion of the basis for use of the linear non-threshold multistage model, the mathematical assumptions associated with utilization of the model, and use of particular studies from which the unit risk numbers for the linear model were generated. Especially important were the caveats explaining that the linear non-threshold model, at best, provided a rough but upper bound limit of the cancer risk, i.e., it is not likely that the true risk would be higher than the estimate, but it could be lower.

- o discussion of the potency of acrylonitrile compared to other suspected carcinogens. Table 13-161, which illustrates this comparison, is a particularly effective

display of the relative potencies of these substances and their estimated unit risks. The Agency agreed to modify Table 13-161 to indicate that the values stated are upper bound risk estimates.

o agreement by the Agency to include in the document information presented to the Committee on estimates of unit risk derived from using three models that are alternatives to the linear non-threshold multistage model. These include the Logit, Probit and Weibull models. The inclusion of these alternative methodological approaches will considerably clarify the Agency's rationale for its risk assessment approach.

The Committee made additional suggestions for improving the final health assessment document for acrylonitrile which are included in the transcripts of the Committee's meetings. With the understanding that these changes will be incorporated in the final document, the Environmental Health Committee has unanimously concluded that the document is scientifically adequate for use in regulatory decision-making.