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DIBENZO-P-DIOXINS: PUBLIC CONCERN AND NATIONAL SCIENCE POLICY

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The environmental contaminants polychlorodibenzo-p-dioxins (PCDDs), and especially the 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), have received extensive public attention for more than 12 years. Dioxins are contaminants formed during the synthesis of chlorophenols and during low temperature combustion of wastes containing chlorinated precursors. Dioxins are at the center of controversies over (1) the use of Agent Orange in Vietnam and the health of veterans, (2) the use of trichloro- and pentachlorophenolic-derived products and (3) the development of technology for the incineration of municipal and industrial wastes.

In response to the concerns over dioxins, and especially TCDD, mobilizations of resources have occurred within the private sector, academic community and state and federal governments. Many of the early efforts dealt with identifying sources of the contamination and elucidating the toxicology. More recently, the focus has been on understanding the chemistry, environmental fate and the mechanisms of toxic action of the dioxins. Industry scientists have been primarily responsible for conducting health studies of industrial populations exposed to TCDD and other dioxins as well as sponsoring many of the early toxicologic studies. The response of the Federal government has been through the coordination and funding of much of the basic long-term research including an impressive commitment to evaluating the human risk of exposure to TCDD. Indeed, this latter program encompasses scientific and financial resources from ten Federal agencies and includes White House oversight of 15 ongoing major human studies including five health surveillance studies and ten epidemiologic studies.

The science policy implications of the massive research and remedial programs underway on dioxin are disturbing. To date, the Federal government has committed hundreds of millions of dollars and thousands of man-years to confirm that actual human exposure to dioxins is minimal and occurs primarily in "hot spots," and that the number of individuals exposed is very low. Moreover, the data collected to date are not able to associate chemical exposure to carcinogenesis, teratogenesis, or mutagenesis in man, yet these data neither impact proposed actions on clean-up (e.g. Times Beach) nor impedes Congressional action to legislate presumptive compensation. Finally, data obtained from combustion studies show that the production of dioxin is minimal and easily controlled with present technology, yet the fear of dioxin has paralyzed incineration technology and its application. The need for realistic risk assessments and the assignment of priorities for the allocation of resources are indicated.