

Risk Assessment at Hazardous Waste Sites. F. A. Long and Glenn E. Schweitzer, Eds. American Chemical Society Symposium Series No. 204, 1982.

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The importance of chemical waste disposal and the use of risk assessment methods have emerged as two major environmental themes for the 1980s. While waste disposal has been necessary since the chemical industry emerged, public concern over waste disposal sites is relatively recent. This concern has motivated a major piece of legislation, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, known as CERCLA or the Superfund Act, in addition to the Resource Conservation and Recovery Act (RCRA) of 1976.

The provisions of the Superfund Act reflect a philosophical debate in which many who are concerned with different areas of environmental regulation are currently engaged. Shall regulatory decisions be based primarily on engineering standards mandating "zero discharge" or "best available control technology," or shall they reflect a perception that *some* releases of hazardous chemicals are acceptable? If the latter philosophy is adopted, then risk assessment is needed to identify the crucial instances in which releases pose dangers to human health or the environment and to provide an explicit basis for choosing appropriate measures to mitigate these dangers.

What is risk assessment and how can it help to establish priorities and policies for dealing with chemical waste sites? The nine papers from the symposium from which this book is drawn do not provide clear answers, but collectively they furnish an introduction to the chemical waste problem that should be highly valuable to analysts and regulators.

E. B. Frost gives a summary of the legislation and EPA's approach to implementation, stressing the history of conflict between those advocating a balancing of risk and cost and those

calling for a zero-discharge philosophy. This conflict remains largely unresolved and risk assessors face a difficult task in addressing waste management on a case-by-case basis. W. B. de Ville illustrates the magnitude of these difficulties from a state regulator's perspective. Despite the uncertainty and complexity of technical information available about a waste site, regulators must make decisions. Technical considerations may be subordinated in favor of legal clarity, simplicity of enforcement, and responsiveness to public perceptions.

V. N. Houk of the Centers for Disease Control shows the difficulty of assessing the impact on human health with accounts of past waste site investigations. D. L. Baeder reviews state and federal agency actions on Love Canal, illustrating shortcomings of current risk management practice.

The next four papers discuss approaches to risk assessment and environmental monitoring. R. H. Drieth presents a three-way risk classification scheme used by Shell Oil. R. A. Young, A. B. Nelson, and L. A. Hartschorn discuss methods for identifying and classifying abandoned dump sites in upstate New York. G. Schweitzer reviews multimedia monitoring techniques for gathering information at hazardous waste sites, while R. B. Evans gives a more detailed presentation on geophysical techniques for site evaluation. The final paper in the volume, by Curtis Haymore of the EPA Office of Solid Waste, provides an overview of how risk assessment is evolving as an approach to hazardous waste management under the RCRA.

It is clear from Haymore's paper and from others in the volume that the application of formal risk assessment procedures to aid in regulatory decision making on hazardous waste will take place in the future. Such procedures have a potential for avoiding costly, ultraconservative engineering requirements while ensuring that public health, welfare, and environmental values will not be significantly compromised. But how can this potential be realized? The present volume yields little insight. The MITRE Corporation model proposed for use by

EPA in establishing priorities is criticized in several of the papers, but neither that model nor alternatives to it are discussed in any detail. The reader is given only broad principles and caveats as guides as to how risk assessments should be carried out.

It will be a challenge to the community of those assessing risk to show that their methods can be helpful for managing hazardous waste under CERCLA and RCRA; the current volume provides an excellent introduction to the dimensions of this challenge.

Effects of Inhaled Particles on Human Health: Influence of Particle Size and Shape. 177 pages. Publications, NRCC/CNRC, Ottawa, Ontario K1A 0R6, Canada.

This document examines the role of size and shape of particles with respect to their entry into the respiratory system, and aims to evaluate effects of these characteristics on health. The authors recommend that size, shape, and chemical composition of particles be considered in all investigations of causal relationships between exposure and human health effects. They also call for studies of regional (alveolar, etc.) deposition and clearance of particles and specific human health effects.

Research and Development on Radioactive Waste Management and Storage. S. Orlowski, Ed. 320 pages. Harwood Academic Publishers, P.O. Box 786, Cooper Station, New York, N.Y. 10276. 1983. \$48.

This book is Volume 8 of a series on nuclear engineering and technology. It describes the status of the European Community's research and development program for radioactive waste management and storage for 1980-84, as of Dec. 31, 1981. The volume covers topics such as characterization of low- and medium-activity waste forms, fuel claddings, land burial, testing and evaluation of solidified high-activity waste forms, and immobilization and storage of gaseous wastes.