Radioactive Waste Management


The organization and presentation of the technical, historical, and political issues relating to the safe handling, treatment, and disposal of radioactive waste is a formidable task. This work addresses all of these issues with varying degrees of success. Beginning with an introduction to the general field of radioactive waste management, including an overview of the "problem," definitions, and a review of current practices, the authors proceed to provide the reader with a vast array of data, regulations, and information covering the full range of radioactive waste from high-level to "de minimis." This book provides a good summary of the current laws and regulations of the USA dealing with most aspects of radioactive waste management. The review of the current and projected inventory of high-level waste, a historical perspective of the disposal options, and the current requirements for site characterization provide the reader with an insight into the complex interrelationships between the scientific and regulatory aspects of this issue.

A review of the various technologies currently available for the disposal of high-level radioactive wastes, low-level radioactive wastes, and mill tailings provides the reader with an overview of the current capabilities of the industry in safely dealing with the problem. Numerous illustrations give basic descriptions of the various conceptual designs and existing technologies ranging from shallow land disposal of low-level wastes to deep geologic disposal of high-level wastes. More exotic means of disposal for high-level wastes, such as ocean disposal, space disposal, and ice sheet disposal are also reviewed. Decontamination and decommissioning, radioactive waste transportation requirements, and site remediation issues are also addressed.

Although the technology for waste handling and disposal are presented, the technical depth and breadth of the presentation are somewhat limited. A good summary of the currently available radiological assessment computer codes is included in Appendix B. However, more technical information pertaining to the actual utility and limitations of these codes would have been helpful. This technical information could have included a brief description of the relevant equations employed in each code and the necessary input data. Incorporation of these codes into the sections dealing with the performance descriptions of each of the various disposal technologies would also have been useful.

Another significant shortcoming of this work is the apparent lack of recognition of the problems of radioactive waste management as an international issue. There were no specific references to the technical developments relating to disposal of radioactive wastes in other countries. A brief review of the technologies under consideration by the French, British, Swedes, and/or Canadians would have made this work more complete. A comparison or contrast between the technologies employed and the regulatory requirements of each of these countries and the USA would have permitted the reader to see the issues of radioactive waste management from an international perspective.

This book generally provides a good introduction to the field of radioactive waste management in the USA. The reader receives an overview of the magnitude of the radioactive waste problem and the current and proposed technologies for dealing with these wastes. Significant technical details and an assessment of the international efforts in radioactive waste management are lacking, however. This work should serve as a good general reference to the technical and regulatory requirements for radioactive waste management.

Management Systems to Reduce Impact of Nitrates


There is widespread recognition that high concentrations of nitrate-N in ground and surface waters pose hazards to human and animal health and to stability of ecosystems. Agricultural sources of nitrate contamination represent both an environmental threat and an economic loss. Awareness of these issues has been particularly acute in Europe, where intensive agriculture is often practiced in densely populated regions.

This volume is a collection of 20 papers presented at a meeting held in Brussels in September 1987, which was organized within the framework of The Commission of the European Communities Programme on Land and Water Use Management. Objectives of the meeting were to: provide an overview of methods used in member countries to limit agricultural sources of nitrate pollution; evaluate recent progress in predicting and controlling nitrate availability in soil; and, highlight researchable problems that remain. Papers were authored by scientists from 12 European countries.

All papers were written in English, which should increase potential readership. However, this book suffers from several minor and even major faults. Lack of sufficient editorial review resulted in several spelling errors, grammatical mistakes, and apparent errors in table headings. Photo-offset printing resulted in a text of uneven quality.

Of greater importance was the apparent lack of thorough peer review of most chapters. Both the methodology and interpretation in some reports could be criticized. For example, one experiment was conducted using surface-applied 15NO3 to measure the effectiveness of cover crops to reduce nitrate leaching over winter. A legitimate question is whether uptake of the surface-applied tracer reflects an ability to remove nitrate from deeper in the soil. In a few instances, authors overemphasized the biological importance of statistically significant correlations. Especially questionable was the statistical treatment of data in one chapter concerning the relationship between N mineralization indexes and corn (Zea mays L.) yield in the field. Lack of rigor makes some of the papers less convincing and causes unnecessary doubt about companion papers in this volume.

Several chapters discuss N management in vegetable production and several others address management of livestock wastes. It was particularly interesting to learn of current (1987) regulations with regard to N management in Denmark in the chapter by J.F. Hansen. J.J. Neetson et al. provided a good summary of fertilizer recommendation approaches being used and those being developed in the Netherlands. Many countries now recommend N fertilizer based in part on the inorganic N content of soil in early spring. Depth of sampling varies with the crop, ranging from 30 to 100 cm. The potential for use of simulation modeling to supplement field data was demonstrated by Neetson et al. The chapter by S. Jarvis et al. on nitrate leaching under grassland was a good summary of both long-term trials and recent experiments. A few of the other chapters provide useful information for interested readers—M.P. RUSSELLE, USDA-ARS and Department of Soil Science, University of Minnesota, St. Paul, MN 55108.