Leachate From Municipal Landfills


It has become increasingly evident that leachate leaking from municipal solid waste (MSW) landfills is degrading the groundwater at many locations across the country. While many of the poor practices of the past which led to air and surface water pollution have been curtailed, most MSW landfills are not sufficiently lined to protect the groundwater from the leachate, which includes the mobile constituents and their metabolites of most products of our modern industrial society. This review of available data on the generation, composition, migration, treatability, and monitoring of MSW leachate serves as a useful reference for those interested in determining the potential pollution hazards from MSW landfills. The book will also be useful to those interested in improving present technology or developing new technology to deal with the ever-increasing volume of MSW being generated.

The authors provide a comprehensive review of the topic including what is known about the hydrological balance of landfills and the models used to simulate leachate generation. However, leaks through cracks in landfill covers which often develop as a result of differential subsidence and are perhaps the largest source of infiltration, are not mentioned in the text.

The concentration of indicator parameters, as well as inorganic ions and metals are summarized in figures which determine typical and extreme reported values. The book describes the time course of concentrations and factors which influence them, e.g., waste shredding and addition of sewage and industrial sludges. Models derived from factors and used to estimate the concentrations are also described. Regrettably, little attention was given to the presence of toxic and mutagenic organic compounds that are found in MSW leachate. A discussion is given of the mechanisms regulating the transport of leachate constituents underlying soils. A useful table is included which lists many of the models that have been developed to predict the movement of contaminants once they reach the groundwater.

The discussion of control technology included considerations of leachate volume, composition, collection, and treatment. Much of the information on control technology is appropriately derived from the recent advances made in hazardous waste landfills, including cap construction and the use of synthetic liners. The possibility of recycling MSW landfill leachate in order to hasten stabilization and diminish long-term pollution potential is among the more promising leachate control technologies that are presented. Both technical and economic data on this and other control methods are provided. The chapter on monitoring summarizes and references much of the current literature and serves as a useful introduction on the topic.

Since the text was developed under an EPA contract, the authors developed a list of research needs that are included as an appendix. The list should be of interest to researchers developing proposals, as well as funding agencies. Research needs that were overlooked, however, include investigations of the infiltration through cracks in landfill caps and further work on leachate recycling to minimize the potential of future groundwater contamination.

The text of this book is well written and readable, but some of the tables are difficult to read. The same material is available at less cost from the National Technical Information Service (PB 84-187 913).—K. W. BROWN, Department of Soil and Crop Services, Texas A&M University, College Station, TX 77843.

Disposal of Industrial and Domestic Wastes:
Land and Sea Alternatives


The Ocean Policy Committee of the National Research Council in 1982 appointed a steering committee to organize a workshop to consider the current state of knowledge of waste management. The workshop, entitled “Land, Sea, and Air Options for the Disposal of Industrial and Domestic Wastes” was held 16–21 Jan. 1983 in Napa Valley, CA. Fifty-five individuals from the social and natural sciences participated and were organized into six panels: public policy, marine sciences, land disposal, biological effects, industrial wastes, and sewage sludge. This volume comprises the reports of six panels and an executive summary. The theme of all of the panel reports is the multimedia approach to waste disposal which is dealt with in broad, general terms and which reflects the particular focus of each panel. This book is not a detailed exposition of waste disposal research and technology but rather deals with the broader issues of waste disposal options and relative risk. The wide range of knowledge and expertise represented by the workshop participants gives credibility to the reports and will be a useful reference for anyone working in the many areas of waste disposal, but will be of particular interest to those public officials involved in establishment and maintenance of waste disposal programs. The major consideration throughout the book of ocean disposal of wastes will be of particular importance to coastal communities.—TERRY J. LOGAN, Agronomy Department, The Ohio State University, Columbus, OH 43210.