

Book reviews

Fundamentals of site remediation for metal- and hydrocarbon-contaminated soils

John Pichtel (Ed.); Government Institutes, Rockville, MD, 2000, US\$ 85, 382 pp., ISBN 0-86587-689-4

Contaminated buildings, soil and groundwater are unvariably legacies of industrial society. The US Congress responded to these problems by passing The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or, as it is more commonly known, the Superfund Act) in 1988 to address (and hopefully remediate) the problems of inadequate past disposal of hazardous wastes and chemicals.

Remediation of contaminated sites is neither simple nor cheap. Each site is unique in its mix of contaminants, geology, groundwater, etc. Consequently, the choice of cleanup technology and the costs will be a challenge to the remediation engineer.

The author, an agronomist by education and professor of natural resources and environmental management, has conducted his own research in hazardous waste management and remediation of contaminated sites. Through consulting assignments, he appears to be knowledgeable in the area of environmental assessment and remediation.

Pichtel states that “Few references in environmental contamination and site restoration provide a satisfactory discussion of the underlying chemical processes inherent during a contamination episode; likewise, chemical processes during the remedial phase of activities are often incomplete”. Consequently, he wrote this book which is “intended to serve as an introductory manual for environmental site restoration practices as mandated by the CERCLA and related statutes, with emphasis on basic environmental chemistry, soil science and microbiology and plant science”, and this he has done well. The book is well written, well illustrated (although the photographs generally lack resolution) and reasonably (though not exhaustively) referenced.

The first segment of the book discusses in general terms the background of the problems. These problems are illustrated by numerous news reports of contamination events. After these short summaries of contamination problems, the introductory chapter is followed by two basic science chapters discussing the “Chemistry of Common Contaminants (metallic Elements)” and a very general chapter on “Hydrocarbon Chemistry and Properties”. (Personally, I would have left these two chapters out as this very basic chemical information should be known to anyone before he/she seriously gets involved in remediation.)

The second, more useful, section of the book deals with remediation problems and technology. Chapter titles are as follows:

- Subsurface properties and remediation;
- Environmental site assessments;
- Isolation of the contaminant plume;
- Extraction processes;
- Solidification/stabilization;
- Soil vapor extraction;
- Microbial remediation;
- Green remediation;
- Innovative technologies.

Most chapters contain a descriptive case study that illustrates the technology topic of the chapter. The final chapter, “Innovative Technologies”, discusses, albeit briefly, new, promising cleanup methods including:

- Electrokinetic remediation (unfortunately, Pichtel did not reference the special issue of the *Journal of Hazardous Materials* devoted to this topic);
- Reactive metallic walls;
- In situ vitrification;
- Plasma centrifugal furnace;
- Pneumatic fracturing and hot gas injection;
- Low temperature thermal aeration;
- Evaporation–catalytic oxidation;
- AquaDetox/SVE.

An appendix “Cost Analysis of Remediation Projects” is a brief description of selected remediation projects in tabular form. Although interesting, I wonder how useful such data are since the project descriptions are so short.

As I read the book I attempted to do so from two very different perspectives; first I tried to assume the role of a remediation engineer and second as a professor. In the first case, I found this book too general and lacking in the depth of topic treatment I would like as a consultant. Most remediation specialists are knowledgeable well beyond the material Pichtel provides. But this was not my opinion as a professor. I think this would be an excellent text, especially if supplemented with problems/exercises. I urge the author to consider the other (university) audience seriously and author a revised edition.

Gary F. Bennett

PII: S0304-3894(01)00187-X

Toxicology testing handbook: principles, applications, and data interpretation

David Jacobson-Kram and Kit A. Keller (Eds.), Marcel Dekker, New York, NY, 2000, US\$ 165.00, 448 pp., ISBN 0-8247-0073-2

According to the editors, this text:

- provides practical guidance to persons responsible for developing toxicology data, evaluating results from toxicology studies, and performing risk assessments;
- serves as a guide for proper study design to help ensure regulatory acceptance;