

The last chapter, Chapter 11, discusses the final step in the risk assignment process, decision-making, and emphasizes risk communication within this process.

This book should be a mandatory reading material for any individual or organization that is involved with remediation of contaminated land.

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*Design of Remediation Systems*, Jimmy H.C. Wang, Chin Hong Lim and Greg L. Nolen,  
CRC Lewis Publishers, Boca Raton, FL, 1997, \$59.95, 263 pp., ISBN: 1-56670-217-8

In the preface, the authors write:

“This book was written to provide a guide for environmental consultants, managers, owners and operators, regulators, and students to perform a remediation design from the assessment phase to completion. It strives to provide engineers with the tools to conduct a pilot test, apply the results, and design a system that is practical and efficient.” I believe they have.

In the text, the authors have focussed on the problem of petroleum-contaminated sites (not trying to encompass all possible contaminants), presenting a plethora of useful information and guidance on ‘remediation practices from the design engineering point of view.’

The book has eight chapters. Following the introductory chapter is a refresher (chapter) course on the chemistry of hydrocarbons (a chapter I think could have been omitted from the chemical engineer’s perspective). However, perhaps geotechnical engineers would say the same about Chapter 3, on geology and hydrogeology concepts, a chapter I found most useful.

For me, the book really begins with Chapter 4, which evaluates the general design approach from remediation project and takes the reader step-by-step through a typical design process. Included in this chapter is a discussion of design based on risk-based corrective action.

The ‘meat’ of the book is found in the next three chapters:

- Design of Soil Vapor Extraction Systems
- Design of Bioremediation Systems
- Design of Pump and Treat Systems

Each chapter is comprehensive with both theoretical and practical information given. However, regarding the theoretical, I would have liked to have seen numerically worked examples for many of the theoretical (and practical) design equations presented, especially air stripping.

Minor criticisms of the text in my analysis include:

- a missing description of air stripping tower packing;

- no discussion other than carbon adsorption (such as catalytic oxidation) for VOC emissions from air stripping towers;
- using too many figures, far beyond the accuracy possible, i.e., in a flow equation, utilizing 1 gpd/ft<sup>2</sup> (one significant figure) as a basis of their calculation, they arrive at a flow rate of 13,939,200 gpm for an aquifer; the latter figure purports to have a six-figure accuracy;
- describing enzymes simply as catalysts that speed up bacterial reactions whereas enzymes are essential to the biological reaction, not just catalysts
- providing only 37 references for the whole text.

Finally, at many points in the text I wanted to rewrite (or rephrase) the material. The authors could have improved the text materially by employing a technical writer. Perhaps they will do this in the next edition.

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*Proceedings of the Fifteenth Technical Seminar on Chemical Spills*, Edmonton, Alberta, Environment Canada, Ottawa, June 1998, 234 pp.

Environment Canada, like the U.S. EPA, has had a long history of activity in regard to spills of oils and hazardous chemicals. Both again have now included contaminated sites (and their cleanup) in their program. As noted in the title of the book, this is the 15th annual seminar and the resulting proceedings thereof.

The volume has 18 papers covering a wide variety of topics contributed mainly (over one-half) by Environment Canada personnel, including M.F. Fingas, a member of the Editorial Advisory Board of the *Journal of Hazardous Materials*, who is the author or co-author of no less than seven (7) papers.

The papers are of variable content and quality being, I believe, non-refereed prior to publication (some could have benefited from a thorough editing).

Some papers contained e-mail addresses for the authors (which I find very useful); some had only mail addresses (which I find helpful); and, unfortunately, some had no addresses at all.

As might be expected, the 18 papers span a wide variety of topics such as:

Hazardous Spill Response:

H<sub>2</sub>SO<sub>4</sub> Spill

Butadiene Tanker Grounding

Computer Resources:

Chemical Compatibility

ERT Web Site Weather ID Project

Spill Model

Monitoring and Analysis:

PCBs Selenium removal

Supercritical fluid extraction