

*Hazardous Waste Site Remediation: the Engineer's Perspective*, by O'Brien and Gere Engineers Inc., Van Nostrand Reinhold, New York, NY, 1988, ISBN 0-442-27210-3, 422 pp., \$38.95.

The book jacket notes that there are more than 20,000 uncontrolled hazardous waste sites in the United States that will require remediation (cleanup). Others feel that there may be considerably more than that. Currently, almost 1200 of the worst sites are listed by the U.S. Environmental Protection Agency on their National Priority List for cleanup under the Superfund (Comprehensive Environmental Response Cleanup and Liability Act). Consequently, the United States faces a monumental technical and economic challenge in completing the needed remediation projects. This very timely book, the first I have seen dealing totally with hazardous waste site remediation, will assist engineers in that cleanup process.

The preface to the book states:

"This book addresses the immediate issue of investigating, designing, and implementing technology to remedy the most challenging hazardous waste sites. The perspective presented is that of the practicing engineer, the one who must see that the solution proposed actually will reduce to acceptable levels the risks posed by the site."

The authors, the staff of a well-known U.S. consulting firm, note that the book is written specifically for upper-level college students in a technical program. I doubt whether there are many students taking so specialized a course; thus this intended audience may be small. But a second audience, the authors note, are those to whom the book furnishes "timely and thoughtful information," i.e. to corporate engineers planning or reviewing remediation work, the plant manager concerned with remediation of a hazardous waste site, and the state or federal official regulating remediation. I think the second audience will be very large. But unnoticed in the target audience (some of whom fall in the previous group) are the large number of engineers, chemists and other scientists who will actually investigate sites (and perform remedial investigations), then suggest cleanup methods (feasibility studies), and actually implement the cleanup process selection. It is the latter group I feel will significantly use and benefit from this book.

The book has 15 chapters under two almost equal-sized major divisions: (1) Assessment and (2) Remediation. These chapters are:

(1) Assessment

1. Introduction to remediation of hazardous waste sites
2. Purpose and execution of field investigations
3. Analyzing hydrogeological conditions
4. Assessing risk

5. The role of the laboratory in remediation work
  6. Health and safety at hazardous waste sites
  7. Ground water models – tracking contaminant migration
- (2) Remediation
8. Developing the feasibility study
  9. The recourse of closure on site
  10. The disposition of ground water
  11. *In situ* biological treatment of groundwater
  12. Correcting leaky underground storage systems
  13. Incineration as a disposal alternative
  14. Closure through off-site remedies
  15. Implementing the remedial measures

In summary, the book thoroughly discusses the approaches practicing engineers can use to implement the U.S. EPA's National Contingency Plan at sites governed by CERCLA regulations. The various chapters show in detail how designs are carried out at remediate sites, i.e. the remedial investigation feasibility study. To that end, the book is well written, well developed and well referenced. For the people described in the opening paragraphs of this review, it will be an invaluable reference and one they should not be without.

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*Volatilization Technologies for Removing Organics from Water*, by J.L. Fleming, Noyes Data Corp., Park Ridge, NJ, 1989, ISBN 0-8155-1189-2, 120 pp., \$39.00.

This book was originally published by the U.S. Environmental Protection Agency (U.S. EPA) under the title "A Selective Guide for Volatilization Technology for Waste Treatment". It is one of a large number of excellent, practical books that the U.S. EPA has published to assist those working in the waste treatment field.

The book's purpose is to assist engineers in determining whether a particular volatilization technology can successfully remove organic contaminants from water. The author describes the performance of common organic compound removal systems and provides an approach for selecting an appropriate removal technique for a given situation (which is normally cleanup of contaminated water and/or groundwater at an uncontrolled hazardous waste site). Data necessary for the evaluation are described, and whenever possible background data are given, for selected organics.

To use this book, the author suggests a five-step process:

- Preliminary assessment of the feasibility of volatilization
- Site characterization