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Book Reviews

The Industrial Wastewater Systems Handbook, Ralph L. Stephenson and James B. Blackburn, Jr., CRC Press, Boca Raton, FL, 1998, $75.00, 495 pp., ISBN: 1-56670-209-7

The problem that I had in reviewing this book is that I wanted to read all of it, line by line. It is one of the most interesting, well-written and, I believe, useful (that means practical) books that I have seen in years of editorial reviewing.

The technical material (I believe) was written by Stephenson, an environmental engineer with a major consulting firm in the U.S. He has over 30 years experience in the design, construction and operation of industrial wastewater plants and in the solving of industrial wastewater problems. His industrial experience shows in the material included in the text, especially from a chemical engineering perspective [although he is a civil engineer by training].

A case in point is his discussion of mixing and mixers. That chapter was excellent. Having taught the topic, I was quite interested in his coverage, and found it comprehensive, even to the point of estimating the weight of a propeller.

But herein lies a problem (for which I have no solution); unless it's a multi-author text (and that brings a whole new set of problems). There was inadequate treatment of several other important topics. The problem is that no person is expert in all areas and, of course, one tends to write enthusiastically (meaning at length) and well in the areas he/she knows best. That is evidenced in this book. The foregoing discussion on mixing being a case in point.

Other topics I felt were well done were his discussions of biological treatment (Chapter 8) and VOCs in wastewater (Chapter 9). A truly innovative chapter dealt with instrumentation (Chapter 12). Having been involved in oversight of a remedial action design program wherein I received a bewildering variety of chemical process flow diagrams (with their equally bewildering use of symbols), I was delighted to see this chapter.

That's the good news. The book, however, has some deficiencies which I hinted at above. Several topics—chemical precipitation, chemical oxidation, air flotation and even oil removal—have far fewer pages devoted to them than I would have wished. Especially lacking (in almost all chapters) are adequate (in my estimation) references to the literature (that was not true for mixing), but then again, I am an academic; the writers are not.

As a case in point, the chapter (7) on Chemical Treatment Processes is only nine (9) pages long. In it, the authors deal with precipitation, chemical feed system design, chemical oxidation, and electrodialysis. Also, the chapter only has five (5) references, four of which are to commercially-produced literature.

As an editor, I was disturbed by the large number of errors in the text at various points, i.e. (1) bod rather than BOD, (2) air floatation vs air flotation, (3) cm/sec vs in./hr.—inconsistent use of periods, (4) continued mixing of SI and British units in the same example.

In most cases, the theory behind a technology is well-developed. But very few worked examples are given. I would have liked the authors to provide numerical calculations based on the equations provided.

Finally, there are three sections of the book I would have omitted. With all due respect to the co-author (an attorney), I would have omitted the first two chapters on the law, especially the second chapter on International Treaties, Laws, and Regulations. Neither chapter added much to the central theme of the book—a practical design manual; nor does the final section at the end of the book, which is a 48-page glossary. Interesting it was, but not a wise use of space, in my opinion. Conversely, I found the 11 pages devoted to the Table of Contents well spent. It is comprehensive.

My overall summary; an excellent book—interesting, well-written (generally), and useful but needing a good technical editor, more references and expansion of some topics (as noted above).

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Permeable Barriers for Groundwater Remediation: Design, Construction and Monitoring, Arum R. Gavaskar, Neeraj Gupta, Bruce M. Sass, Robert J. Janosy and Dennis O'Sullivan, Bettelle Press, Columbus, OH, $44.95, 1988, 188 pp., ISBN: 1-57477-036-5

Contamination of the subsurface by dense, nonaqueous phase liquids (DNAPLs) presents a major challenge to current cleanup technology. These liquids, dominated by chlorinated solvents, are denser than water and of limited solubility. Thus they move downward in the soil until they encounter a low-permeability zone or aquitard. Forming pools, these compounds with relatively low solubility present a major challenge to engineers who try to remove them solely by pump-and-treat operations.

Such contamination is not uncommon as chlorinated solvents have been commonly used in a wide variety of operations, such as degreasing, maintenance and dry cleaning. Sloppy handling and ill-advised (from current disposal perspectives) disposal practices have led to widespread contamination of soil and groundwater. Ten of the twenty-five most common groundwater contaminants at hazardous waste sites are chlorinated solvents with trichlorethylene being the most prevalent.