



## Book review

### **Vadose Zone: Science and Technology Solutions, Volumes I and II**

Brian B. Looney and Ronald W. Falta (Eds.), Battelle Press, Columbus, OH, USA, Vols. 1 and 2, 2000, US\$ 95.00, 1580 pp. + CD-ROM disk, ISBN 1-57477-085-3

The vadose zone is, by definition, “The geological media between (the) land surface and the regional water table.” Interesting in this definition is the word *vadose* which in translation means shallow. But it is not well understood.

Recognizing the failure of existing approaches to adequately characterizing, monitoring, remediating and predicting solute fate and transport behavior in the vadose zone, Looney and Falta undertook a 2-year project to edit this comprehensive two-volume series. This project involved more than 100 scientists and three national workshops. Their efforts resulted in a 1500-page, 10-chapter, peer reviewed two-volume set. The entire book and case studies are provided in electronic format on an enclosed CD-ROM.

“*Vadose Zone Science and Technology Solutions* describes all aspects of comprehensive vadose zone program development, including basic hydrogeology, characterization, and contaminant behavior. The book

- Introduces and defines the vadose zone and vadose zone contamination, including a detailed discussion of the fundamental physical and chemical processes.
- Discusses the components needed to formulate a cost-effective and responsible ‘comprehensive vadose zone program’.
- Describes baseline and state-of-the-art vadose zone characterization methods, including classic tensiometers and samplers and surface and borehole geophysics.
- Describes the fate and transport of vadose zone contaminants, including discussions of chemistry, geology, and modeling.
- Documents the state of the art for containment and remediation of vadose zone contaminants.
- At each stage, identifies gaps in current understanding and various solutions or suggestions for filling these gaps.
- Presents a future technology focus.”

The general objective of the editors in producing these books was to “document important concepts of vadose zone science and to describe the state of practice, the state of the art, and future directions in this important area.” In my opinion, they have succeeded admirably in this task.

As noted above, the book has 10 chapters, which are:

- Volume I
  1. The vadose zone: what it is, why it matters, and how it works.
  2. Managing an effective vadose zone project.
  3. Vadose zone characterization and monitoring: current technologies, applications and future developments.
  4. Performance monitoring.
- Volume II
  1. Flow and transport modeling of the vadose zone.
  2. Biogeochemical considerations and complexities.
  3. Remediation of organic chemicals in the vadose zone.
  4. Remediation of inorganic contamination in the vadose zone.
  5. Barriers and containment methods.
  6. Future science and technology focus.

Following each chapter is (are) one or more case studie(s) (totaling 130 in all) used to illustrate the scientific issues discussed in the chapter.

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