Book Review: Environmental Sampling and Modelling for the Prediction of Long-Term Water Quality of Mine Pit Lakes

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"Environmental sampling and modelling for the prediction of long-term water quality of mine pit lakes" by C.E. Oldham (121 pages, 12 figures, 6 tables) was published by UWA Publishing, Crawley, Western Australia in 2014. The book aims to provide an "initial assessment of the most important parameters to be modelled or monitored during all stages of mine life" in order to predict the water quality of pit lakes. It is not a detailed sampling and modelling handbook, but is meant to serve instead, in the author's words, as an "entry point" for more detailed dealing with the predictive modelling of pit lakes and the respective monitoring.

In order to reach these goals, the book is structured into six chapters and an appendix. The introduction provides a basic overview on the formation, management, end-use, and water quality of pit lakes and the associated regulatory issues. The second chapter introduces conceptual hydrologic and biogeochemical modelling, while modelling of water and mass balances as well as complex hydrodynamic and ecological models are discussed in the third chapter. The fourth chapter provides the strategy of data collection and the fifth chapter lists the variables to be monitored or modelled. The sixth chapter draws conclusions and the appendix provides recommended references for further reading.

Although three other books on pit lakes were published between 2009 and 2013 (Castendyk and Eary 2009; McCullough 2011; Geller et al. 2013), the book of C.E.

Oldham is a valuable addition. The above mentioned goals of the book (as listed by C.E. Oldham in the Foreword) are fully reached. The book is valuable because it is concise and because it emphasizes practical aspects of monitoring and modelling rather than merely providing an academic perspective. In addition to providing a basic understanding of pit lakes and an orientation to the growing body of literature on pit lakes, it addresses the importance and scope of predictive modelling and provides guidance on which type of specialists are needed for that. Therefore, the book would be particularly useful for those who have not yet dealt with pit lake issues in detail or wish to have a basic overview because they are involved in the planning, creation, and management of pit lakes and need to understand why certain monitoring and modelling is needed at certain times to ensure success for mine closure and future beneficial end-use of pit lakes. Potential readers would include mining company managers, government regulators, and engaged citizens.

I particularly liked that the list of variables to be monitored or modelled was arranged considering three different perspectives: (1) the issue to be predicted (water balance, mass balance, etc.), (2) the stage of mine life (pre-mining, mine operation, lake filling, post-filling), and (3) the priority for different kinds of modelling (conceptual modelling, modelling of balances, or complex hydrodynamic-ecological modelling). This produced some redundancies, but made Chapter 5 much more useful. Also, the thematic structuring of the recommended references was very helpful from my point of view. It enables an interested reader to select additional papers to read that are particularly relevant for the task to be managed. Some additional publications from 2011, 2012, and 2013 might have been worth including, like Dietz et al. (2012). However, anyone

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who reads the provided list of references would be well prepared to plan and manage pit lakes.

In summary, I recommend the book to all who are faced with the planning and management of pit lakes. Finally a practical hint: the Australian Centre for Geomechanics (http://www.acg.uwa.edu.au/publications#MC_env), rather than the publisher mentioned above, is acting as distributer of the book.

References

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