Groundwater

The Art of Water Wells

reviewed by Erin Haacker

The Art of Water Wells (Glotfelty 2019) is a practical introduction to all aspects of water well siting, development, and maintenance. It is the quintessential manual: detailed enough to be used as a reference, but clear enough to be read straight through. The volume itself is charming and high-quality. Almost every page has a full-color diagram or photo. The book also comes with a fold-out poster of its first appendix, showing the steps in well design and installation.

The book is organized into five chapters, following the order of operations for well drilling. The first chapter, "Site Selection," includes hydrogeologic and political considerations, and gives an example for a prioritization technique. Chapters 2–4, "Water Well Design," "Well Drilling Methods," and "Well Installation Oversight," take the reader through the engineering aspects of well materials and construction. The fifth chapter, "The Economics of Water Wells," contains original research pertaining to the life cycle costs of wells, using data that few individuals would be able to access, let alone process efficiently, as the author does. Limitations to the text are noted, so that the reader can look for further information.

The book is short, not because it leaves things out, but because the author is excellent at distilling the relevant information. For example, on pages 55–56: "In diagrams of well cross-sections, the well casing and screen are always nicely situated within the center of the perfectly aligned borehole. In reality, however, boreholes almost certainly have less-than-perfect plumbness and alignment, and even a borehole drift of 1/2 degree can cause the well casing and screen to lie to one side of the borehole after installation. . . . " The author not only suggests a remedy (casing centralizers) but also notes that these should be similar in composition to the parts they touch. The previous section noted the potential for corrosion when certain materials are adjacent, and this is obviously not something the reader would want to realize in retrospect.

I was most impressed by the book's pragmatism. The author boasts over 35 years of experience in water wells, and it shows. Each section focuses on the most important information to keep in mind, rather than taking refuge in hypothetical or idealized situations. The potential for unintended consequences is highlighted, bridging across chapters to illustrate the outcomes of decisions—if you made the wrong choice in one of the early steps, a later chapter will show how you're going to pay for it. By page 70, I have full faith in the author when he asserts, "Whether mathematical calculations or charts are used, it is important to incorporate . . . projected values into every well design. The results can be catastrophic if the well designer just assumes that the well construction will proceed without problems when the pressures, weights, and volumes remain unknown." Glotfelty doesn't make well construction look easy, but he does point out the pitfalls, in a clear and straightforward tone.

This book could be used as a how-to manual for a single well project or an introduction for a beginner, but an ideal reader is someone who is already an expert in one aspect of water wells and wishes to communicate with others across a project. I would also recommend this book for anyone who will oversee a drilling project, such as a municipal employee or farmer who might be sinking half a million dollars into a hole in the ground with few opportunities to learn from mistakes. The economic considerations in Chapter 5 were particularly eye-opening from this perspective. Based on its quality, clarity, and pragmatism, I could not be more pleased to recommend *The Art of Water Wells*.

Reference

Glotfelty, M.F. 2019. *The Art of Water Wells*. Westerville, Ohio: NGWA Press.

Department of Earth and Atmospheric Sciences, University of Nebraska-Lincoln, 1215 U Street, Bessey Hall 330, Lincoln, NE 68588; ehaacker2@unl.edu

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