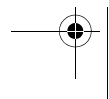
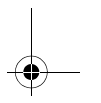
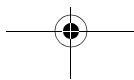
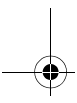
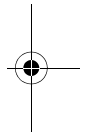
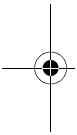
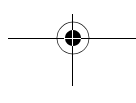
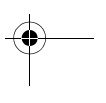
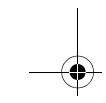
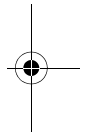
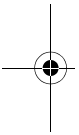
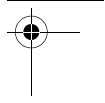
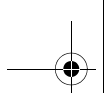
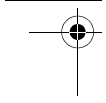


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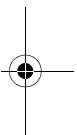
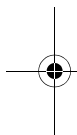






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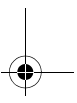
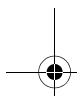
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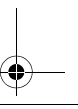
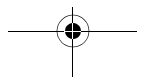
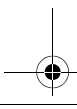
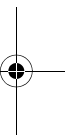
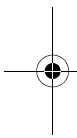
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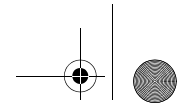
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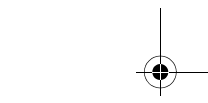
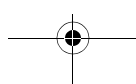
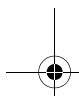
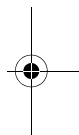
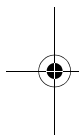
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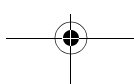
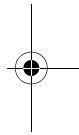
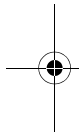
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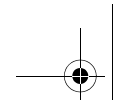




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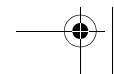
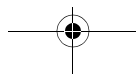
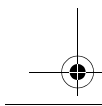
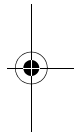
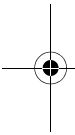
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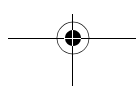
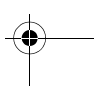
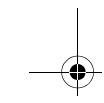
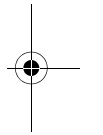
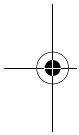
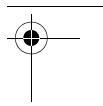
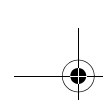
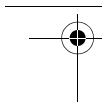




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STATE BAR OF TEXAS



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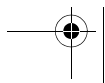
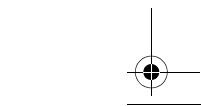
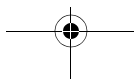
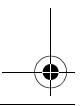
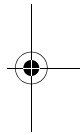
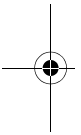
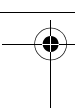
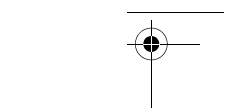
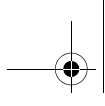
The State Bar of Texas is proud to present *Essentials of Texas Water Resources*, a landmark treatise that provides attorneys and water law professionals with a comprehensive tool for understanding the growing field of water law.

On behalf of the State Bar, I would like to thank the Environmental and Natural Resources Law Section for its efforts on this project over the last three years. The State Bar of Texas is committed to a continuing legal education program that includes publications designed to improve professional competence. We are grateful to the section for its contribution in furtherance of that commitment.

We would especially like to thank the book's editor, Mary K. Sahs. Her leadership and dedication were fundamental in bringing this project to fruition; without her diligence, knowledge, and tireless effort, we could not have provided this valuable work to you.

Harper Estes
President, State Bar of Texas

P.O. Box 12487, Capitol Station, Austin, Texas 78711-2487, (512) 463-1463





Foreword

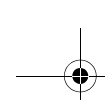
Essentials of Texas Water Resources is a comprehensive work, bringing together in a single volume all aspects of Texas water law and resource management. Although differences in style exist among the chapters prepared by several contributors, the overall content is an invaluable research source and a guide to relevant legal, scientific, economic, technical, and social factors involved in development of water resources. The opening two chapters are especially good at laying the foundation for the specific-issue chapters that follow by discussing the characteristics of the resource and providing an overview of allocation and use issues. Chapter 1 presents the hydrologic cycle, measurements of water, and valuation of water, and includes ethical values regarding allocation and use of water resources. Even experienced water law practitioners will find this chapter a useful refresher, showing the complexities and interdisciplinary aspects of water management. Chapter 2 provides a general overview of planning and the regulatory permit process for water allocation. The history and background of the allocation of surface and groundwater resources are addressed in separate chapters. The book also contains chapters on topics not commonly covered in water law books. Examples include public financing, water supply districts and utilities, wholesale water suppliers, involuntary “takings,” landowner liability for altering surface runoff, and water supply for subdivisions.

Often the material in a chapter is controversial, but its presentation is thorough and objective, and the authors draw on their experience with the issues to offer practical advice and suggestions. There are chapters on the permit process, transfers of water rights, groundwater conservation districts, water supply for subdivisions, and surface and groundwater rights transfers, as well as federal programs like dredge and fill permits, NPDES permits, and section 401 state water quality certification. Overall the book addresses in depth all the contemporary issues in water law.

The timing is excellent for a one-volume work on Texas water resources. Water law in Texas has been in flux since the 1950s. At first there was only ad hoc, project-by-project planning for surface water projects. That system evolved in 1997 into a regional planning process for surface water that could serve as a model for other states. The changes in 1997 went from a top-down statewide development plan to bottom-up regional plans that are consolidated into a state water plan. Using those regional plans, the Texas Water Development Board compiled a state water plan that is updated every five years.

Texas has long been one of the last states to recognize the rule of capture for groundwater. That rule, too, has changed over the years. In 1949, the legislature first authorized underground water districts. In 1997, renamed as Groundwater Conservation Districts (GCDs), those districts became the preferred legislative means to address groundwater planning. Today, 90 percent of groundwater pumpage is done within the boundaries of GCDs, and those districts impose various permit, conservation, export, and other rules, altering the traditional rule of capture. In the early 1990s the legislature created the Edwards Aquifer Authority (EAA) to establish a permit system for withdrawals from the aquifer to protect flows to springs and endangered species. Currently a case involving the EAA is on appeal to the Texas Supreme Court and presents the question whether the rule of capture is a property right or a





Foreword

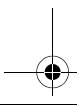
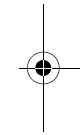
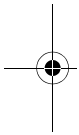
tort liability rule. The state concluded most of the adjudications of its rivers by the late 1980s, and the last adjudication, the Upper Segment of the Rio Grande River Basin, was completed in 2007. And in 2007 the state began a regional, aquifer-wide planning process for groundwater. These new programs will be followed in later revisions of the book.

Because multiple contributors prepared chapters on narrow topics that may overlap one another, care should be taken to use the cross-references to appropriate chapters that examine specific issues in greater detail. The utility of the book lies largely in its scope, providing in a single volume information on topics as diverse as river authorities, interstate compact rivers, water availability modeling, conservation and reuse, and watermasters. The book covers all the current hot topics and problem areas in water resource development.

Newcomers to Texas water law should be aware that the agency handling water rights has changed over the years, and its different names should be kept in mind when researching older materials, cases, or statutes. The Texas Commission on Environmental Quality, or TCEQ, is the agency since 1997 charged with administering most programs relating to surface water rights and water development. The predecessors to the TCEQ include the Board of Water Engineers (1913–62), Texas Water Commission (1962–65), Texas Water Rights Commission (1965–77), Texas Water Commission (second time, 1977–93), and Texas Natural Resources Conservation Commission (1993–97). The predecessors may be seen in pre-1997 cases, articles, reports, or statutes. Similarly, Groundwater Conservation Districts have existed since 1997. Some districts have the older rubric, Underground Water Conservation District. An example is the High Plains Underground Water Conservation District No. 1, which was the first groundwater district in the state. In addition, water rights have had different names over the years, including appropriations, riparian rights, certified filings, permit rights, and certificates of adjudication.

A debt of gratitude is owed to Mary Sahs, who spearheaded this project. As editor, she has spent countless hours organizing the contents, finding contributors, and reviewing drafts and final versions of the book. Her efforts have paid off in an extraordinary compilation of material on all facets of water resources in Texas.

—Frank F. Skillern
George W. McCleskey Professor of Water
Law, Emeritus, Texas Tech University,
Lubbock, Texas





Preface

I grew up in El Paso, Texas—a desert city with little vegetation and scant rainfall. The mighty Rio Grande of my childhood was a wide concrete channel separating Mexico and the United States. I can honestly say I do not remember ever seeing flowing water in that channel, although there must have been. I attended and graduated from UTEP—the University of Texas at El Paso—nestled beneath the smoke stacks of the ASARCO facility and a stone’s throw from Juarez. Air quality concerns led me to law school, where I took every environmental and natural resource law class that was offered. When I attended my first water law class, taught by Professor Corwin Johnson, I was astonished and fascinated by the idea that there was more to water than turning on the tap. Thus began my intense interest in water law.

Since then I have come to understand the significance and fragility of this marvelous, critical natural resource. My hope is that as a community we are ensuring that our children are being taught an awareness of our collective responsibility for safeguarding and managing water.

Let me say at the outset: This book would not exist but for the help and encouragement I received from fellow lawyers Jeff Civins and Bane Phillippi. They greeted my idea for a treatise on Texas water law with respect and enthusiasm. Together we developed the general scope and outline of the book, interviewed prospective publishers, and presented the project to the Executive Committee of the Environmental and Natural Resources Law Section of the State Bar of Texas, requesting its sponsorship. Thanks also to Todd Chenoweth, Glenn Jarvis, Mary E. Kelly, Suzanne Schwartz, and Robin Smith for assistance in developing the original outline and determining the general scope of the book.

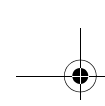
My assistant, Jasmine Beitz, has been invaluable. Jasmine has kept the project’s several thousand moving parts running smoothly, serving as grand organizer and communicator with more than 100 individuals participating as authors, peer reviewers, editors, sponsors, and publishers. Thank you, Jasmine.

My personal gratitude goes to Sherry Priest and David Ashmore of TexasBarBooks for their immediate enthusiasm for the project. In large part, they are responsible for the decision that the book would be published by TexasBarBooks. The staff of TexasBarBooks has been a dream to work with—responsive, professional, and committed to ensuring the highest quality publication. Thank you to Diane Morrison, Senior Editor, and her entire staff.

My thanks also go to the members of the Executive Committee of the Environmental and Natural Resources Law Section for their unwavering support for this project.

Of course, the book would not exist without the authors. The list of authors reads like a “who’s who” of Texas water law and includes technical experts as well as attorneys. These professionals provided valuable time and effort to ensure the success of this project. I am truly grateful for their efforts.

Every chapter underwent many rounds of editing, both by me and by the legal and copy editors at TexasBarBooks. Additionally, John Ashworth served as technical editor for the chapter on groundwater availability modeling. Suzanne Schwartz served as technical editor for the chapter on water project financing. Professor Ronald Kaiser assisted by editing the



Preface

chapter on surface water transactions. My appreciation goes to all the editors for a task well done.

Each chapter was also extensively peer reviewed. The peer reviewers, like the authors, are well-respected names in Texas water law and management (in alphabetical order): Monte Akers, Michael Booth, Bob Brandes, Sara Burgin, Doug Caroom, Lyn Clancy, Lauren Crawford, Stephen Dickman, Leonard Dougal, Greg Ellis, Darcy Alan Frownfelter, Todd Galiga, Amy Hardberger, Myron Hess, Jace Houston, Glenn Jarvis, Russ Johnson, Professor Ronald Kaiser, Lauren Kalisek, Marc Knisely, Steve Kosub, Robert Mace, Ed McCarthy, Janet McQuaid, David Meeseey and the Texas Water Development Board Office of Planning (Regional Project Managers), Robin Melvin, Drew Miller, Bill Mullican, Jim Murphy, Monique Norman, Ken Petersen, Rima Petrossian, Robert Pressley, Stephan Rogers, Andy Sansom, Suzanne Schwartz, Lynn Sherman, Cindy Smiley, Robin Smith, Angela Stepherson, John Stover, Lambeth Townsend, Professor Venkatesh Uddameri, Ben Vaughn, and Bruce Wasinger. Their valuable feedback was greatly appreciated.

As with any project of this length and complexity, plans change over time. We experienced changes in authors and peer reviewers, changes in the legal, policy, and regulatory landscapes, and changes in the scope of the chapters and topics to be included in the final product. There is a long list of individuals who have my deepest gratitude for accommodating these shifting circumstances and in many instances stepping into gaps with little notice.

Special thanks go to authors who stepped into the breach with very short notice: Colette Barron Bradsby, Denise Cheney, Ross Henderson, Susan Maxwell, Cindy Smiley, Angela Stepherson, Deborah Clarke Trejo, and Hope Wells.

My personal thanks to those individuals who submitted draft manuscripts that were not included in the book because of overlapping topics or other changes in the scope and organization: Robert Flores, Phil Haag, Josh Katz, Ken Ramirez, Frank Ruttenberg, and Paul Terrill.

Finally, I want to thank Professor Frank Skillern, who is a former chair of the Environmental and Natural Resources Law Section and who performed the final review of the entire manuscript and wrote the foreword for the book.

This has been a tremendous challenge, and it is with a great sense of satisfaction that I present this book to the reader. My hope is that it will be a favorite, close-at-hand resource for all who have the privilege of learning about or participating in the essential tasks of water resource management in Texas.

—Mary K. Sahs
Editor





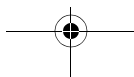
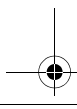
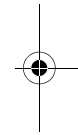
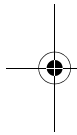
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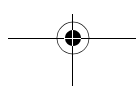
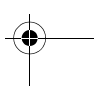
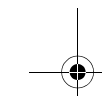
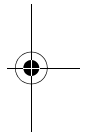
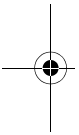
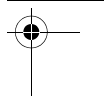
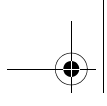
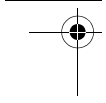
There has been a need for some time for a comprehensive guide to address and compile information about water rights, water use, and water quality in Texas. Not only have practitioners in this area been required to resource numerous statutes, regulations, codes, and regulatory guidance, but the laws in Texas have also been changing rapidly over water rights and water planning in the last ten years—and continue to do so.

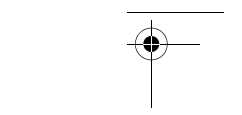
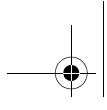
Gathering the information and data for this book has been a monumental undertaking, and the Environmental and Natural Resources Law Section owes a debt of gratitude to Mary Sahs and her assistant, Jasmine Beitz, for many long hours to make this project successful.

We also appreciate the contributions of all our authors, without whose dedicated work this book would never have been completed.

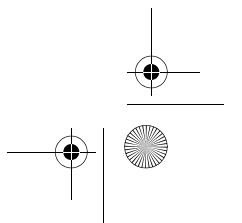
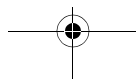
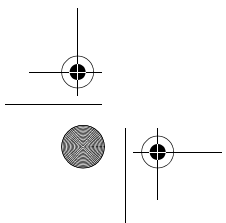
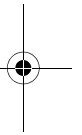
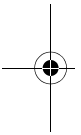
—Mary Koks
Chair, Environmental and Natural Resources
Law Section, State Bar of Texas

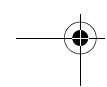
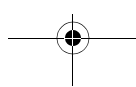
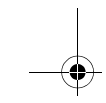
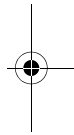
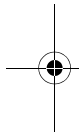
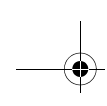
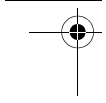


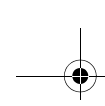




Essentials of Texas Water Resources

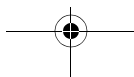
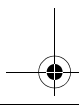
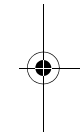
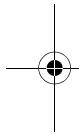


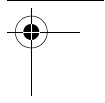
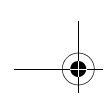
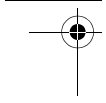
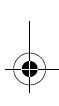




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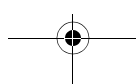
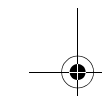
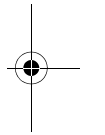
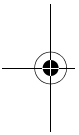
**Overview of
Dual System of Water Rights:
Surface and Groundwater**





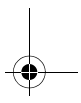
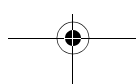
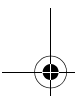
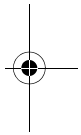
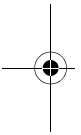
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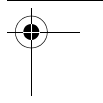
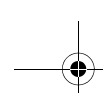
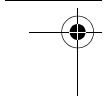
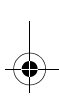
Surface Water





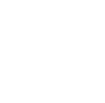
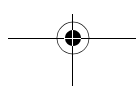
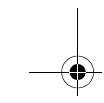
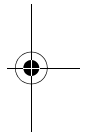
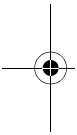
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Groundwater

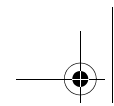




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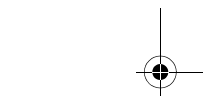
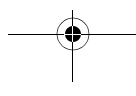
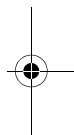
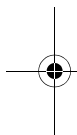
Water Planning





PART E

***Selected Issues in
Water Resource Law***





PART F

***Drinking Water
Supply Issues***

