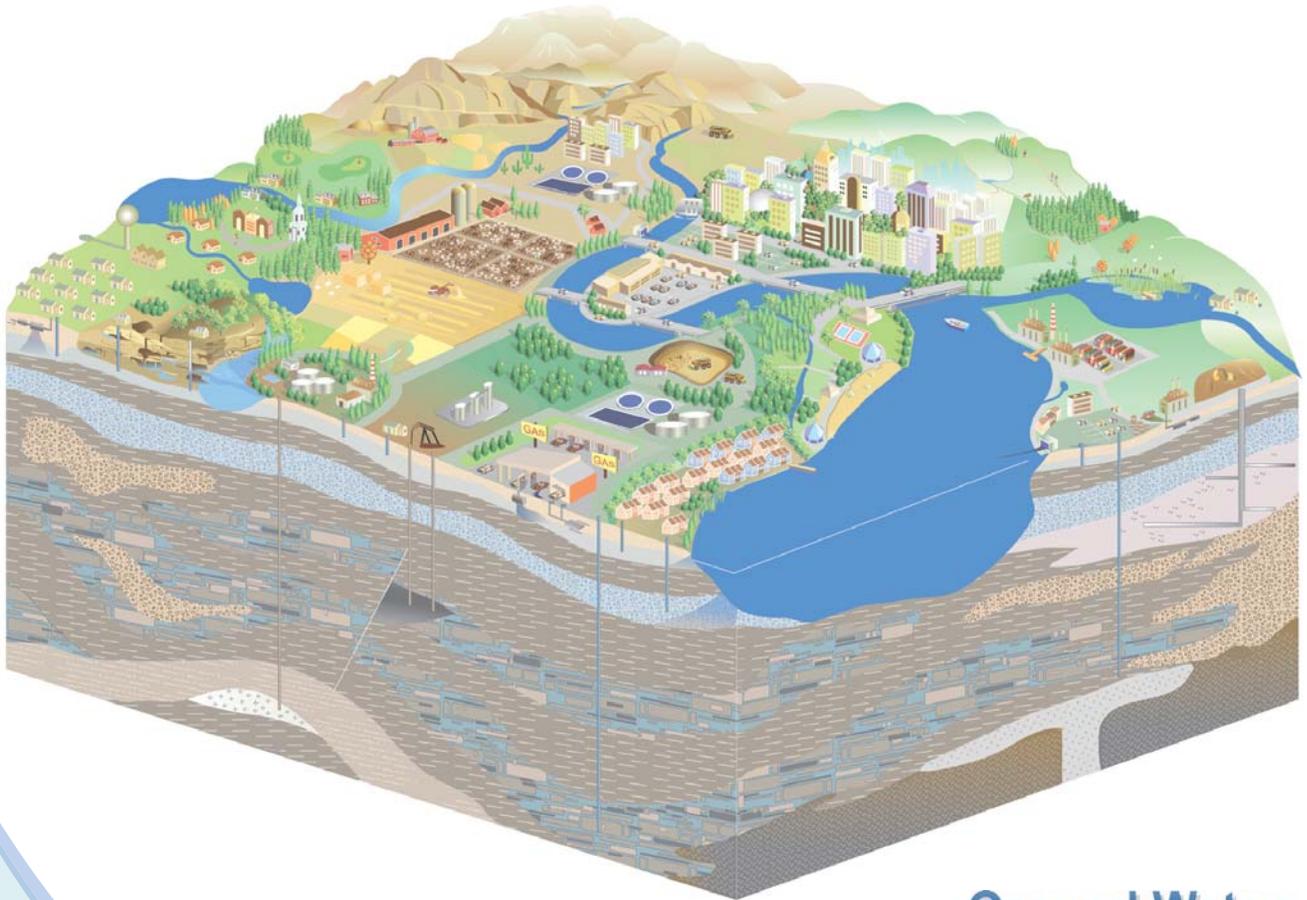




Ground Water Report to the Nation: *A Call to Action*



Ground Water
GWPC
Protection Council



To the Reader:

I would like to thank the myriad of state, federal, and local agencies, affiliated associations, universities, and individuals, who have so willingly helped in producing this document. They are too many to list here, but without their help, this document would not have happened. The Ground Water Protection Council Board of Directors and Editorial Board were always positive during this process, and without their review and input, the document would have lacked real-world examples and experiences.

I would like to thank the staff of the Ground Water Protection Council for their lasting enthusiasm for this endeavor and especially Jean McDowell, our in-house report manager, for her dedication and effort from start to finish.

Publication of this report marks the end of one effort and, we hope, initiates a new effort to promote increased awareness that will foster a nationwide commitment to take action to protect ground water.

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Foreword

Ground Water Report to the Nation: A Call to Action

Congratulations to the Ground Water Protection Council for developing this call to action to protect one of America's most vital, yet undervalued, natural resources: ground water. We seem to lose sight not only of the resource, but of its importance. Almost half of the nation's citizens obtain their drinking water from ground water wells—from either public water systems or private wells. Ground water is also critical to maintaining surface water quality and healthy wetlands.

We know ground water is contaminated or threatened in communities around the country from varying sources such as underground storage tanks, septic systems, and agricultural activities. Our ground water is also threatened by excessive pumping, which can lead to saltwater intrusion in coastal areas, land subsidence, or increased vulnerability to drought conditions.

Collaboration is key to water quality protection because it offers opportunity to coordinate actions and achieve positive water quality outcomes. In early 2006, I was pleased to make a commitment with GWPC and 11 other national organizations to work together to protect sources of drinking water. The partners in this Source Water Collaborative recognize solutions transcend political and organizational boundaries. To effectively protect drinking water, we must work together and reach people at the local level where decisions that affect drinking water quality are made. Helping communities understand the effect of land use and stewardship decisions on the environment and public health is an important and appropriate role for EPA, and the work of Source Water Collaborative partners, like the "Ground Water Report to the Nation: A Call to Action," will be critical in this effort.

As stewards of our nation's waters, we need to "think like a watershed" and strive for integrated, holistic and sustainable approaches. EPA looks forward to working collaboratively with our local, state and federal partners to protect public health and the water environment, above and below ground, for today and tomorrow.

Benjamin H. Grumbles, Assistant Administrator for Water
U.S. Environmental Protection Agency



Foreword

Ground Water Report to the Nation: A Call to Action

Growing up, I remember many visits to my grandparents' farm in Webster County, Nebraska. Lulling me to sleep and waking me in the morning was the sound of the ground water pump in the yard. Those long summer days planted the seeds for my career as founder and President of The Groundwater Foundation. Somehow I knew, even then, that the ground water pumping from the well was the heart of the farm itself. A Webster County child herself, American author Willa Cather understood this too, writing:

"The roots of the tall, branching cottonwood drank deep from hidden waters, deep in the soil. The waters of ancient springs had been found on the virgin prairie...and under the long shaggy ridges she felt the future stirring."

This hidden and ancient resource creates fierce pride in the hearts of its protectors, and this pride is ably demonstrated by the Ground Water Protection Council's *Ground Water Report to the Nation: A Call to Action*. Like the artesian springs of the Ogallala Aquifer, ground water is about to emerge from the shadows and take its rightful place in the national consciousness.

Ground Water: A Call to Action is our map and bugle call for this journey.

The report, and accompanying poster and summary sheets, propel ground water stewardship forward by underscoring its growing importance as an environmental and economic resource, the threats to its quantity and quality, and the urgency of protecting it.

As our map, the report helps us more fully understand that:

- Ground water and surface water are one resource and their protection depends on the simultaneous protection of both.
- The earth's surface is not a particularly effective filter, and ground water availability and quality contain the indelible footprint of human endeavor.
- All natural resources, including ground water, are connected to each other and to the communities and people they sustain.

As our bugle call, the report provides strategies and tools for:

- Increased program coordination and collaboration on every level.
- Activating watchful citizens through land-use planning, enhanced monitoring, and ground water inclusive policies at the local, state, and federal levels.
- Finding the resources to implement nature- and technology-based best management practices.

I've always believed that protecting ground water brings out the best in human nature, and the *Ground Water Report to the Nation: A Call to Action* reflects this fact. As you read and reflect, you'll find yourself knowing more, caring more, and in your mind's eye, doing more.

Are we up to the challenge? We'd better be. Our environmental and economic future depends on it.

Susan S. Seacrest, President, The Groundwater Foundation



Contents

Ground Water Report to the Nation...A Call to Action

There are numerous ground water issues and human impacts to ground water that could have been selected for this first Ground Water Protection Council *Report to the Nation*. As the Key Messages and Recommended Actions were developed for each selected topic, it was tempting to broaden the discussion to other connected topics. However, to stay focused, it was necessary to limit our scope to ten specific topics, and limit the discussion within each topic as well. The following Sections can be identified according to their respective names and colors on the tabs.

GROUND WATER...A CALL TO ACTION

● **Why this urgent call to action?** We are at a ground water crossroads that necessitates ingenuity and proaction in order to minimize potentially detrimental and costly consequences. Each of us shares responsibility for securing the availability, integrity, and ecological balance of our nation's water resources—for the long haul. It is way past time for us to recognize the significance of ground water to our national welfare—our public health, quality of life, and economic well-being.

GROUND WATER USE AND AVAILABILITY

● **Why does ground water use and availability matter?** Potable fresh water is fast becoming a highly sought-after commodity—it is being called “blue gold.” Yet the fact that all the water we have right now is all the water we will ever have is not reflected in our demand for and use of water. As a nation, we can no longer put off the job of answering the essential and definitive questions of supply and demand: Will we have enough water, and what will it cost?

GROUND WATER RESOURCE CHARACTERIZATION AND MONITORING

● **Why does ground water characterization and monitoring matter?** While we have made strides in understanding how ground water/surface water systems work, our ability to characterize how our human activities affect the many natural processes and interactions inherent to specific systems has been constrained. This is primarily due to the lack of long-term sustained support and funding for ground water quality and quantity data collection, analysis, research and development trends, and information dissemination.

GROUND WATER & SOURCE WATER PROTECTION

● **Why does source water protection matter to ground water?** Without diligent attention to managing potential sources of contamination, our drinking water will come at a higher cost over time. This cost includes the increasing need for water treatment, monitoring, remediation, finding alternate water supplies, providing bottled water, consultants, staff time, and litigation. Source water protection is simpler, less expensive, and more reliable over the long term.

GROUND WATER & LAND USE PLANNING AND DEVELOPMENT

● **Why does land use matter to ground water?** Each time the use of a land area changes, it can affect the hydrologic makeup of the landscape. Highways, shopping centers, housing developments, industrial sites, businesses, agricultural operations, golf courses, feedlots, waste disposal sites, airports, ski slopes, and sewer systems (to name a few) have the potential to directly or indirectly impact the quantity or quality of both ground water and surface water.



GROUND WATER & STORMWATER MANAGEMENT

● **Why does stormwater matter to ground water?** In natural, undeveloped areas, a large percentage of relatively uncontaminated precipitation infiltrates the ground, thus recharging the ground water; the remaining runoff flows to nearby water bodies or evaporates. Natural physical, chemical, and biologic processes cleanse the water as it moves through vegetation and soil and into ground water. Development alters natural systems as vegetation and open spaces are replaced with impervious surfaces, such as parking lots, highways, and roofs, that greatly reduce infiltration and thus ground water recharge. Uncontrolled stormwater runoff collects pollutants such as sediments, pathogens, fertilizers/nutrients, and hydrocarbons, which ultimately contaminate and degrade surface and ground water.

GROUND WATER & UNDERGROUND STORAGE TANKS

● **Why do underground storage tanks (USTs) matter to ground water?** Each UST system has the potential to leak, threatening human health and the environment. Leaked product contaminates ground water used for drinking and other uses and, on occasion, enters surface water. Today's improved UST systems are the product of federal and state requirements and programs, improved technologies, and a heightened awareness on the part of tank owners and operators. However, leaks still occur, albeit far less frequently, and we must stay vigilant in order to prevent tank systems from leaking in the first place and to ensure that leaking systems are reported immediately and cleaned up expeditiously.

GROUND WATER & ONSITE WASTEWATER TREATMENT SYSTEMS

● **Why does onsite wastewater treatment matter to ground water?** Nationwide, decentralized wastewater treatment systems (e.g., septic systems) collect, treat, and release about 4 billion gallons of effluent per day from an estimated 26 million homes and businesses. More than half of these systems were installed over 30 years ago, when rules were nonexistent, substandard, or poorly enforced. The percentage of homes and businesses served by these systems varies from state to state, from a high of about 55% in Vermont to a low of about 10% in California.

GROUND WATER & UNDERGROUND INJECTION CONTROL

● **Why does the underground injection control (UIC) program matter to ground water?** The federal UIC Program, designed to prevent contamination of underground sources of drinking water, covers wells used to inject a wide range of fluids, including oilfield brines; industrial, manufacturing, pharmaceutical, and municipal wastes; and water used for solution mining. A "mature regulatory" program suggests that the major processes are working smoothly, the principal issues are well understood, and significant problems encountered have been solved. While this is the case for Class I, II, III, and IV UIC well types, the Class V category of the UIC program has not kept pace with the rest of the program. Nor is the UIC program well positioned to address new challenges and responsibilities, such as CO₂ geosequestration and management of water-treatment residues.

GROUND WATER & ABANDONED MINES

● **Why do abandoned mines matter to ground water?** Many abandoned coal mines and hardrock mines emit acid mine drainage, because the rock associated with both types of mines often contains metal sulfides, such as pyrite. When the rock or coal deposits are excavated, the sulfides are exposed to water and oxygen, and react to form sulfuric acid. Many surface and underground abandoned mines, and their associated spoil and refuse piles, provide ongoing sources of acid mine drainage and toxic heavy metals that can have long-term devastating impacts on ground water, community water supplies, rivers, streams, and aquatic life.