



# Twenty-First Century Infrastructure – the Groundwater Industry’s Role

The National Ground Water Association (NGWA) is the largest organization of groundwater professionals in the world. In that position, NGWA seeks to provide guidance to members, government representatives, and the public regarding the sound scientific, economic, and beneficial development, protection, and management of the world’s groundwater resources.

The groundwater industry is poised to help move the nation forward in ensuring its long-term water and energy needs are met. Focused, informed federal government policies and funding that support 21st century infrastructure can assist in achieving a secure water and energy future while providing jobs for groundwater professionals.

## From the Hoover Dam to Aquifer Storage and Recovery Systems

The Hoover Dam, built during the depths of the Depression, provided jobs, energy, and water to an expanding West. In 2011, the era of major dam building is over. Today managed aquifer recharge projects are helping cities and agriculture interests meet their water supply needs in the face of unprecedented drought and growing populations.<sup>1</sup> Managed aquifer recharge provides a method to replenish groundwater supplies by capturing available water (during wet periods, during periods of low demand, or water that would be lost otherwise) and storing it in underground reservoirs called aquifers. Aquifer storage and recovery (ASR) is one technique, among others, to convey and store this water underground, in this case through wells for later recovery through the same well or a nearby production well. The first ASR well began operation in Wildwood, New Jersey, in 1969. In 2009, a U.S. EPA inventory identified 542 ASR wells nationwide. ASR wells are located in nine of the ten EPA regions and their number has more than quadrupled since 1999.<sup>2</sup> Federal support for water infrastructure should include managed aquifer recharge projects.

## **Revitalizing Cities and Protecting Public Health**

An estimated 450,000 brownfield sites pockmark the nation's landscape.<sup>3</sup> These sites formerly hosted facilities that produced the nation's goods, services, and jobs. Currently, however, the expansion, redevelopment, or reuse of that land is hampered by the potential for contamination presence that could endanger public health. Groundwater professionals determine the presence and extent of contamination, develop remediation plans as warranted, and undertake the necessary steps to bring the sites back to productive use while protecting public health. Besides work for these professionals, an estimated 72,000 jobs have been leveraged by assessment or cleanup activities conducted with EPA brownfields funding.<sup>4</sup> For example, Prineville, Oregon, used a \$200,000 EPA Brownfields Cleanup Grant to remove more than 2,700 tons of petroleum-impacted soil and demolished buildings on a former gas station property in a key downtown location. With funding leveraged from a number of public-sector sources, Prineville integrated this once-contaminated property into the new City-County Government Services Complex.

NGWA asks for your support of brownfield grants for assessment, revolving loan funds, and cleanup as discussions involving infrastructure funding move forward.<sup>5</sup>

## **Infrastructure That Focuses Education and Defense Dollars on Education and Defense**

Schools and defense facilities around the country have installed geothermal heat pump systems. These facilities are currently reaping the benefits of energy savings and reduced costs. These energy cost savings can be turned to improving educational outcomes and targeting defense dollars to security measures.

"GHP (geothermal heat pump) schools used approximately 26% less source energy per square foot of floor area," according to an evaluation of Lincoln, Nebraska, schools by the Department of Energy.<sup>6</sup> The report concludes that the schools using GHP technology "outperform others in the school district."<sup>7</sup>

GHPs "can be an energy efficient alternative for federal facilities when designed and installed properly," according to a 2007 Defense Department report. According to DOD's analyses, the most cost effective regions for use are in the South, Southeast, Midwest, and Mid-Atlantic states.<sup>8</sup>

The United States was once a leader in GHP technology utilization, but no more. Europe and other nations now have more GHP installations on a per capita basis.<sup>9</sup> All is not lost though, the United States still has a strong domestic GHP manufacturing base—with more than 99% of rated tons installed in the U.S. in 2009 (latest data available) manufactured here. China accounts for the remaining GHP installed tonnage.<sup>10</sup> Diversification into GHP design and installation is one of the few bright spots for groundwater professionals involved in the construction market. In fact, nearly 40 percent of groundwater professionals say that government support for alternative energy will be one of the most significant forces impacting their business prospects over the next three years.<sup>11</sup>

## **Rebuilding Drinking Water Infrastructure**

88.03 million Americans depend upon 107,848 community supply wells serving 40,025 community water systems with 14.6 billion gallons of groundwater every day for their drinking water supply. An estimated \$94.9 billion is needed over the next 20 years by community and non-profit non-community drinking water systems for capital improvements related to source water (both surface water and groundwater) or treatment equipment, areas where NGWA members have expertise.<sup>12</sup> Approximately \$1.2 billion is currently provided annually through the U.S. Department of Agriculture and U.S. EPA community drinking water system loan or grant programs for all capital funding needs.<sup>13</sup> Given scarce federal resources, U.S. EPA and USDA community water system funding should be focused on projects that address potential public health issues affecting current community water systems, rather than community water system expansions, which are more appropriately addressed by local investments. Additionally, before committing federal funds for drinking water infrastructure,

the life cycle cost of drinking water delivery options, including the use of private water wells with appropriate treatment in rural areas, should be fully evaluated.

41.9 million Americans depend upon 13 million household supply wells using 3.7 billion gallons of groundwater every day for their drinking water supply. An estimated 80,000 households (0.66%) have individual drinking water well systems that require replacement or additional treatment, according to U.S. Census Bureau data.<sup>14</sup> An estimated \$88 million would be required to update or add treatment to these household water well systems. Approximately \$1 million is currently provided annually through the U.S. Department of Agriculture's water well program to provide long-term, low interest rate loans to low income rural Americans for the purchase of new or upgraded home wells or treatment systems.

Groundwater professionals determine water supply availability; engineer and install water wells, pumping and treatment systems; and service these systems. Especially at this time, when new construction and housing are at a standstill, marshalling the skills and knowledge of these professionals to refurbish and upgrade existing drinking water systems and infrastructure in this country is a win-win situation.

**The groundwater industry is poised to help move the nation forward in ensuring its long-term water and energy needs are met.**

## The Groundwater Industry

The groundwater industry employs more than 200,000 individuals. They are involved in water well and pump installation and service, environmental consulting, remediation, education, and the manufacturing and distribution of products.<sup>15</sup>

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## Dates

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## References

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The National Ground Water Association is a not-for-profit professional society and trade association for the global groundwater industry. Our members around the world include leading public and private sector groundwater scientists, engineers, water well system professionals, manufacturers, and suppliers of groundwater-related products and services. The Association's vision is to be the leading groundwater association advocating for responsible development, management, and use of water.



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