NATIONAL WATER REUSE ACTION PLAN

Update on Collaborative Progress
April 2021

The WRAP collaborative was developed with federal, state, tribal, local, and water sector partners to build technical, financial, and institutional capacity for communities to pursue water reuse practices. When considered as part of an integrated, watershed-based management approach, reuse can enhance water security, sustainability, and resilience and help to solve local water resource quantity and quality challenges.

The WRAP's 11 strategic themes help to focus efforts and inspire future action.

Resilience Through Collaboration

The National Water Reuse Action Plan (WRAP) collaborative reflects the coordinated efforts of more than 100 organizations to build state and local capacity to advance reuse and strengthen water security, sustainability, and resilience. Over the last year, EPA and water sector partners have made meaningful progress to advance water reuse planning and implementation and support our water future in the face of climate change. For example, EPA is using innovative infrastructure financing tools to target investments back into our communities where they are needed most, providing over $1 billion in credit assistance for water reuse projects.

EPA is taking a holistic approach to water reuse by incorporating reuse principles into its water policies and programs while continuing to deepen its partnerships under the WRAP. There is more work to be done, including advancing watershed-based management approaches under the "one water" framework, expanding focus on water equity and environmental justice, and increasing alignment of the energy and water sectors to help address climate change. Water is the medium by which many communities experience climate stress, and reuse can help make our systems more resilient to its impacts.

We look forward to building on this progress by supporting the WRAP collaborative effort, since we know our partnerships are fundamental to ensuring safe and reliable water resources for our communities today and for future generations. As we collectively envision the future evolution of the WRAP and contemplate what has been accomplished so far, please consider what still needs to be done and join us in the effort.

Benita Best-Wong
Deputy Assistant Administrator for Water
U.S. Environmental Protection Agency

Water Reuse as a Climate Resilience Tool

The changing climate is challenging many communities to meet their long-term water needs, while addressing existing water infrastructure problems. Reuse of treated wastewater and stormwater for agricultural, non-potable, or even potable uses provides an alternative source of water that can be more reliable than traditional raw water sources. The capacity to incorporate water reuse into a community's water portfolio can provide resilience against climate-induced impacts.

"The WRAP process has been a great opportunity for all interested parties to work together and cooperate on the many facets of water reuse."

-Mike Paque,
Ground Water Protection Council

"With the WRAP collaboration we've been able to focus on innovative approaches, especially water reuse. Working across agencies means greater impacts on the ground to conserve and sustain the water resources we all rely on."

-Terry Cosby,
U.S. Department of Agriculture

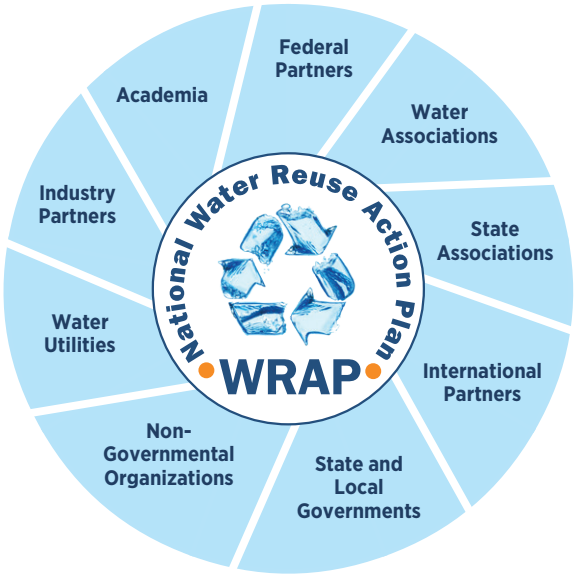
"The National Blue Ribbon Commission for Onsite Non-potable Water Systems is proud to partner on the WRAP as we need to all work together to meet our shared goals. That is why this project is so important—it is a great example of collaboration and rising up together to solve the great challenges of our time."

-Paula Kehoe,
San Francisco Public Utilities Commission

Year in Review: WRAP Collaborative Implementation Progress

During initial development and through this first year of implementation, the WRAP served as a powerful convening tool around water reuse. It has enabled the formation of action-based partnerships among various types of organizations across the water community to help address local water resource challenges. While some of these groups had already worked together, the WRAP helped foster new ways to collaborate and sparked the formation of entirely new relationships that will likely thrive for years to come.

More than 100 organizations and individuals have stepped forward to identify needs, develop actions, and implement their plans to drive progress on water reuse across the WRAP's 11 strategic themes. Through their dedication, commitment, and effectiveness, the action teams completed 165 implementation milestones over the past 13 months, including three full WRAP actions. Ongoing collaborations include: coordinating reuse research, developing financial assistance tools, and conducting targeted community capacity building. The following pages describe examples of action team achievements, focusing on technical, financial, and institutional aspects of water reuse.



First Year Snapshot

The figure below shows the growth of WRAP collaborators, actions, and milestones, as well as the completed actions and milestones since the start of WRAP implementation.

105
partners and leaders

44
WRAP actions

359
implementation milestones

The WRAP is a first-of-its-kind collaboration between EPA, other federal agencies, and more than 100 action leaders and partners, and has prioritized collaboration from day one. Indeed, between the fall of 2018 and the winter of 2020, hundreds of individuals from non-profit organizations, municipal utilities, state regulatory agencies, academia, and elsewhere came together to help shape the initiative and offer meaningful commitments. We strongly support the WRAP as a tool to catalyze greater adoption of water recycling to enhance our resilience against the impacts of climate change across the country and beyond."

-Patricia Sinicropi, WateReuse Association

What's driving reuse? Reducing impacts associated with groundwater overdrafts.
Hampton Roads Sanitation District is looking to permit five projects in Virginia to reduce land subsidence, slow saltwater intrusion, and reduce nutrients entering the Chesapeake Bay by treating wastewater to a high level and then injecting the treated water into the Potomac Aquifer.

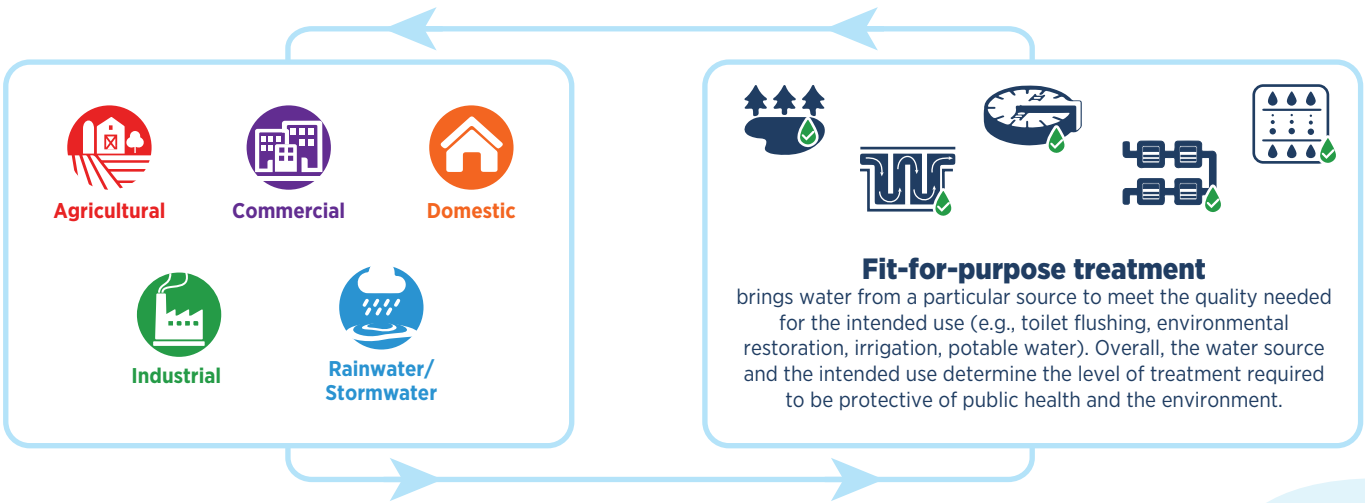
TECHNICAL ACCOMPLISHMENTS

- **Enabling water reuse research.** Federal agencies provided critical support to advance research on priority reuse topics. For example, as part of its Small Business Innovation Research (SBIR) program, the U.S. Environmental Protection Agency (EPA) announced Phase I awards of $800,000 for water reuse technology research in April 2021 (Action 7.5), and the U.S. Department of Energy (DOE) is awarding $27.5 million for research and development for advanced water resource recovery systems, which include water reuse (Action 4.3).
- **Creating technical guidance and tools for onsite non-potable reuse.** In partnership with the Water Research Foundation (WRF), the National Blue Ribbon Commission published a guidance manual and training materials on onsite non-potable water systems (ONWS). The materials synthesize public health guidelines and regulations to offer clear details on how to design and implement an ONWS. As part of the effort, EPA launched its complementary Non-Potable Environmental and Economic Water Reuse (NEWR) Calculator, a web-based decision support tool to quantify the availability of alternative water sources for building-scale reuse (Action 3.4).
- **Examining stormwater capture and use challenges and opportunities.** In February 2021, more than 650 water professionals from across the country gathered for two live webinars on stormwater capture and use: one on drivers and barriers and one on developing treatment standards. Twenty-five action leaders and partner organizations, researchers, and expert local practitioners worked together to produce the webinars (Action 3.3).
- **Compiling existing fit-for-purpose specifications.** EPA, in collaboration with eight other organizations, is developing a compendium of state and international water reuse regulation and guidance documents and summarizing their scientific underpinnings. This will be a valuable resource for water reuse practitioners who want to know more about existing regulations and should help inform best practices (Action 3.1).
- **Advancing research on the treatment of produced water for uses outside the oil and gas sector.** In January 2021, the New Mexico Produced Water Research Consortium issued a request for proposals for research and development projects evaluating treatment technologies; produced water availability; quantitative risk assessments; and socio-economic, environmental, and ecological cost-benefit analyses. The Consortium's proposal review team chose six treatment and three modeling and analysis proposals to move forward in the research process (Action 4.2).

Primary Water Reuse Objectives

- **Water security:** The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socioeconomic development.
- **Water sustainability:** Ensuring an adequate, reliable, and continual supply of clean water for human uses and ecosystems.
- **Water resilience:** The ability of a water supply (e.g., a water system or an asset of a water system) to adapt to or withstand the effects of rapid hydrologic change or a natural disaster.

Examples of Reuse Sources and Uses



FINANCIAL ACCOMPLISHMENTS

- **Clarifying water reuse project eligibility in SRF programs.** EPA clarified water reuse project eligibilities for the Clean Water and Drinking Water State Revolving Fund (SRF) programs to demonstrate the full range of eligible projects. EPA created fact sheets and a best practices guide to identify examples of successful projects and support for water reuse through the country's largest water infrastructure federal financing programs (Action 6.2A).
- **Helping enable local implementation.** EPA's Water Infrastructure Finance and Innovation Act (WIFIA) program highlighted eligibility for water reuse projects and issued over $1 billion in credit assistance for local water reuse projects (Action 6.2B).
- **Supporting water reuse in agriculture.** The U.S. Department of Agriculture (USDA) announced a $15 million investment to help support the adoption of innovative conservation approaches on agricultural lands, including water reuse as a priority. Additionally, USDA is providing new and innovative technologies for aquifer and groundwater recharge through two interim practice standards, "Managed Aquifer Recharge" and "Groundwater Recharge Basin or Trench" (Action 2.12).

INSTITUTIONAL ACCOMPLISHMENTS

- **Advancing reuse through EPA partnership programs.** The Agency is integrating water reuse concepts into its Urban Waters Program and National Estuary Program, which operate in 48 watersheds nationwide. An April 2021 report inventories reuse and integrated water resource management activities within the programs and will serve as a foundation to leverage strong multi-stakeholder relationships to identify reuse opportunities in communities across the country (Action 1.4).
- **Enhancing state collaboration.** In September 2020, five state associations involved in water and public health (ACWA, ASDWA, ASTHO, ECOS, and GWPC) collaborated with EPA and WateReuse to virtually convene 150 regulators across 35 states at the 2nd State Summit on Water Reuse and later publish a Summit summary report (Action 2.2).
- **Building tribal capacity for reuse.** EPA and the San Pasqual Band of Mission Indians prepared, delivered, and posted a training webinar, titled "Keys to Success: Water Recycling in Tribal Communities." In addition, EPA met with several national tribal organizations and Regional Tribal Operations Committees in 2020 and early 2021 to discuss tribal interest in and needs to support water recycling (Action 2.15).
- **Institutionalizing water reuse within EPA.** The Office of Water established a Water Reuse Team to facilitate WRAP implementation and grow the Agency's capacity to support reuse as a key resilience tool. EPA also designated contacts within each of its 10 Regional offices to assist states, tribes, and territories in their reuse activities (Action 10.3).
- **Raising global awareness of reuse.** The U.S Department of State (DOS) organized a series of webinars on global water reuse examples and applications, engaging thousands of participants from around the world through live, interactive sessions. The ongoing series complements actions to build international capacity for water reuse, including through expert exchanges and pilot programs (Action 11.2).

New Actions Added to the WRAP

The WRAP incorporates new actions over time to stay responsive to current needs and challenges surrounding reuse. Along with 19 new action leaders and partners, the WRAP has added seven actions since its release in February 2020:

+ **Develop Case Studies of Successful Low-Input Water Reuse Solutions to Meet Local Water Needs** (Action 1.5, led by ECOS)
+ **Viral Pathogen and Surrogate Approaches for Assessing Treatment Performance in Water Reuse** (Action 3.6, led by EPA)
+ **Implement and Manage the National Alliance for Water Innovation (NAWI) Energy-Water Desalination Hub** (Action 4.6, led by DOE and NAWI)
+ **Evaluate and Optimize Low-Input Treatment Methods to Remove Pharmaceutical Residues from Treated Wastewater Used for Irrigation** (Action 4.7, led by USDA)
+ **Identify Monitoring Practices for Reuse Applications** (Action 5.2, led by WRF)
+ **Quantify the National Volumes of Water Potentially Available for Reuse for Municipal Wastewater and One Additional Source of Water** (Action 5.5, led by EPA, WEF, and WateReuse)
+ **Engagement with Disadvantaged and Rural Communities on Water Reuse** (Action 8.5, led by EPA)

What's driving reuse? Enhancing water security through portfolio diversification. Utilities in the state of Washington are reusing wastewater for non-drinking purposes including wetland restoration, groundwater replenishment, and commercial toilet flushing. This reused water is a reliable and sustainable supply for existing and future needs.

Looking Ahead: 2021 and Beyond

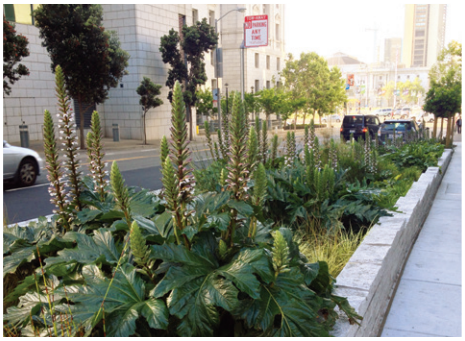
The WRAP was conceived as a collaborative effort to support water reuse as part of an integrated approach to help improve the security, sustainability, and resilience of the nation's water resources. Water reuse is a key tool to help enhance community resilience against climate-induced impacts and improve our overall water infrastructure. As WRAP action leaders and partners continue to implement the existing 40+ active actions and build on the success from the first year, many significant action outputs and achievements are expected in the coming months. Examples of upcoming milestones are presented on the following page.

To help ensure progress, EPA's Water Reuse Team remains committed to working with WRAP leaders and partners to assess and communicate the status of action implementation and to broadly share relevant information, findings, and tools from the action teams as milestones are completed. By engaging with collaborators, the Water Reuse Team also plans to identify and pursue additional strategic opportunities to address water reuse implementation challenges, while building on recent accomplishments and existing active actions.

Ultimately, the WRAP collaborative strives to ensure that water reuse is accessible, straightforward to implement, and sensitive to climate and environmental justice considerations. Over time, the collective efforts of the more than 100 organizations and individuals participating in WRAP actions can grow the body of reuse knowledge and best practices for the benefit of all.

Envisioning Success by Strategic Theme

The WRAP's 11 strategic themes help to focus efforts and inspire future action. For example, the theme **"Science and Specifications"** currently includes five active actions that are laying the critical groundwork for a clear, evidence-based rationale for reuse specifications, which will increase public trust and protection of public health. The theme **"Technology Development and Validation,"** with five active actions, is striving to ensure appropriate treatment technologies are available and performance information is consistent and accessible.



> ***The State Department continues to raise awareness of the importance of water reuse as a pathway to water security around the world. The WRAP is a great example of the strong leadership and creativity we need to sustainably manage our water resources and is a useful roadmap we share with partner countries to catalyze action on water reuse. We look forward to engaging with the WRAP team to build capacity for water reuse globally."***
>
> *-Marcia Bernicat, U.S. Department of State*

> ***The WRAP seeks to advance the cutting edge in water recycling—and to do so responsibly, in a way that prepares for the curveballs climate change is throwing at us. It brings EPA together with state, local, NGO, private sector, and academic leaders, recognizing the benefits of working together to face the future and motivating us all to reach further."***
>
> *-Felicia Marcus, Water in the West, Stanford University*

What's driving reuse? Augmenting existing water supplies. In Texas, the San Antonio Water System delivers highly treated recycled water to golf courses and commercial customers to reduce demand on the Edwards Aquifer.

UPCOMING WRAP ACTION MILESTONES IN 2021

Spring

Release integrated water resources management case study compilation (Action 1.2, led by WateReuse, collaborating with NGWA, ACWA, AWWA, City of Roseville (CA), NYC DEP, and Parker Groundwater)

Hold Israel-U.S. virtual collaboration event on water reuse (Action 11.1, led by EPA, MoEP, and MoEI, collaborating with DOS, Embassy of Israel, Israel Water Authority, USDA, U.S. Embassy in Israel, WateReuse, and FDA)

Summer

Release case studies on pharmaceutical takeback programs as an example of source control to enhance recycled water quality (Action 2.9, led by LACSD, collaborating with AWWA, AMWA, NACWA, NSAC, EPA, FDA, and WateReuse)

Award up to $6.2 million STAR Grant for reuse research on viral pathogen and surrogate approaches for assessing treatment performance (Action 3.6, led by EPA, with research undertaken by awardees)

Issue multi-year $6.5 million cooperative agreement to support water reuse research (Action 10.3, led by EPA)

Fall/Winter

Launch online compilation of fit-for-purpose specifications (Action 3.1, led by EPA, collaborating with ACWA, AMWA, ASDWA, ASTHO, CDPHE, WRF, WateReuse, and WY DEQ)

Hold expert convening on stormwater capture and use (Action 3.3, led by EPA, JFW, NMSA, ReNUWIt, WateReuse, and WEF, collaborating with ACWA and AMWA)

Complete design process for an interagency decision support tool for communities to explore federal funding sources for water management projects that afford resilience benefits, including those for water reuse (Action 6.1, led by EPA, collaborating with USDA, FEMA, Reclamation, DOE, USACE, HUD, and DOT)

Release white papers on aquifer storage and recovery and aquifer recharge (Action 7.4, led by GWPC and EPA, collaborating with USDA and NGWA)

Release Reclamation's advanced water treatment research roadmap (Action 7.6, led by Reclamation, collaborating with the Federal Water Treatment Working Group)

> *The WRAP is a new path for sector-wide collaboration in the water space, bringing together unlikely partners and engaging people and organizations in the planning process. The WRAP has given ASDWA the opportunity to expand and deepen partnerships with other organizations working towards improving the management of our nation's water resources."*
>
> *-Wendi Wilkes,*
> *Association of State Drinking Water Administrators*

> *The use and reuse of water spans a spectrum of users and regulators and requires collaboration between EPA, FDA, and other sister agencies. Through this collaboration, we are able to collectively address concerns in effective ways, including the needs of stakeholders and regulators."*
>
> *-Kruti Ravaliya,*
> *U.S. Food and Drug Administration*

What's driving reuse? Increasing water availability and protecting water quality. Communities throughout northeastern Massachusetts are capturing and using stormwater at the building scale to help address drought conditions and protect the quality of local surface waters.

Call to Action: Join the Effort

Our collective success is directly tied to contributions and collaborations from members of the water community. There are many ways to get involved in the WRAP:

- **Stay in the loop.** Join the WRAP listserv for periodic updates by emailing waterreuse@epa.gov.
- **Learn about actions.** Find details on each action, including their outputs, in the WRAP Online Platform.
- **Support an active action.** Reach out to action leader(s) about possible roles through the contact information provided in the WRAP Online Platform.
- **Provide input on proposed actions.** To address identified needs and knowledge gaps related to water reuse, proposed actions are introduced in each WRAP Quarterly Update. The public is encouraged to provide feedback by emailing waterreuse@epa.gov.
- **Propose a new action.** Ideas for new actions can be shared at any time. For information about how to propose an action, visit the lifecycle of a WRAP action webpage.

Together, we can help ensure the security, sustainability, and resilience of our most precious resource: WATER.

Benefits of the WRAP Collaborative

- **Fosters connections** among a diverse, growing network of experts, policymakers, and practitioners.
- **Taps into knowledge** across the United States and internationally.
- **Aligns efforts** and leverages resources to accelerate progress.
- **Addresses challenges** and fills knowledge gaps.
- **Highlights success** and facilitates broad information sharing.
- **Supports integrated approaches** to water management and challenges "stovepiping" in the water sector.

> *The consensus process guiding the WRAP has brought together the many entities involved in water reuse across scales and geographies to generate a focused and steady stream of new resources and dialogues to support water reuse needs, including those of state regulators."*
>
> *-Julia Anastasio,*
> *Association of Clean Water Administrators*

Communicating Progress and Accomplishments

The WRAP Online Platform, which includes all WRAP actions, is updated weekly based on input from action leaders. WRAP Quarterly Updates were released via e-newsletter in July 2020, October 2020, January 2021, and April 2021 and will continue into the future. These communication tools help ensure transparency and shared accountability throughout WRAP implementation.

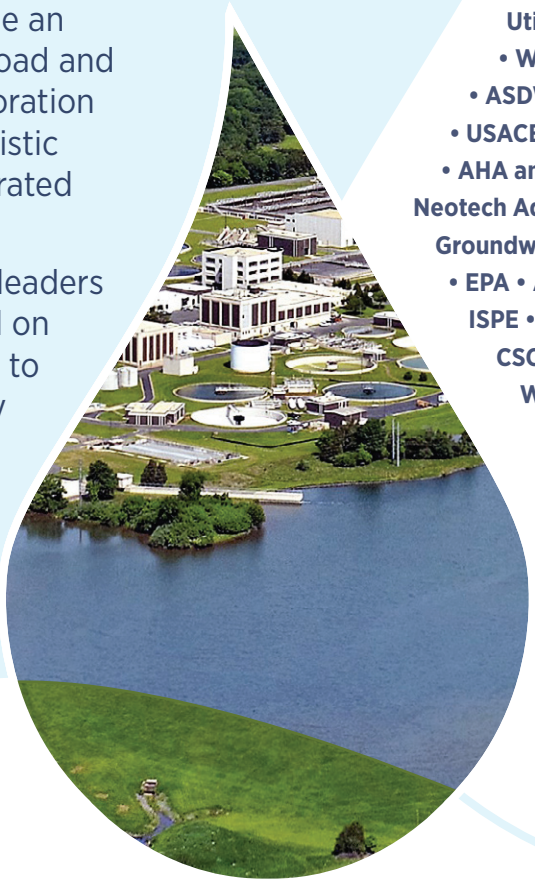
> *The WRAP is harmonizing our efforts to drive toward a shared vision of what water and energy infrastructure needs to look like now – and into the future."*
>
> *-Kelly Speakes-Backman,*
> *U.S. Department of Energy*

What's driving reuse? Accommodating population growth. The city of Wichita, Kansas, allocates treated wastewater instead of drinking water for industrial applications, saving enough drinking water for nearly 5,000 households.

Building an Enduring Legacy of Watershed-Based Action

The WRAP seeks to enhance and stimulate watershed-based collaborations where business, finance and policy leaders, communities, nonprofits, and others come together to solve local water resource challenges. Water reuse approaches provide an opportunity for broad and meaningful collaboration while fostering holistic thinking and integrated action.

The WRAP action leaders and partners listed on this page continue to help build capacity for water reuse and increase the resilience of our communities.



NAWI FDA • LADWP • WTA • USWP • Urban Waters Partnership Locations • NTC • WW • NYC DEP • UWFP • EPRI • WRF • Natural Systems Utilities • WSWC • Groundwork USA • WateReuse • MoEP • SBIR Programs • ASDWA • GlaxoSmithKline • NEP • Ecolab • USACE • Design Aire • HUD • GreenBiz Group • AHA and ASHE • Suez • GWPC • RTOC • WaTr • Neotech Aqua • NDRP • WEF • Tyson • NMSA • Parker Groundwater • GSA • Embassy of Israel • NSAC • DOS • EPA • ASHRAE • CIFA • USGBC • DOT • Reclamation • ISPE • DOI • NPS • GCE • AWWA • ECOS • RN • RCAP • CSO • ASLA • SCCWRP • IU • NWRI • NRWA • FEMA • WYDEQ • University of California • Wahaso • Austin Water Utilities • DOE • ORNL • Commerce • NTWC • LACSD • ReNUWIt • USAID • USGS • CDPHE • NMSU • NGWA • ACWA • DOD • Xylem • ICC • NMED • IAPMO • City of Roseville, California • US Water Alliance • GCCI • CA SWRCB • NACWA • AMWA • NBRC • MWD • JCI • USDA • NM-PWRC • NREL • Columbia Water Center • IWA • ASTHO • JFW • PHASC • Rice University • SAWS • U.S. Embassy in Israel • SWAN • MoEI • Penn State

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