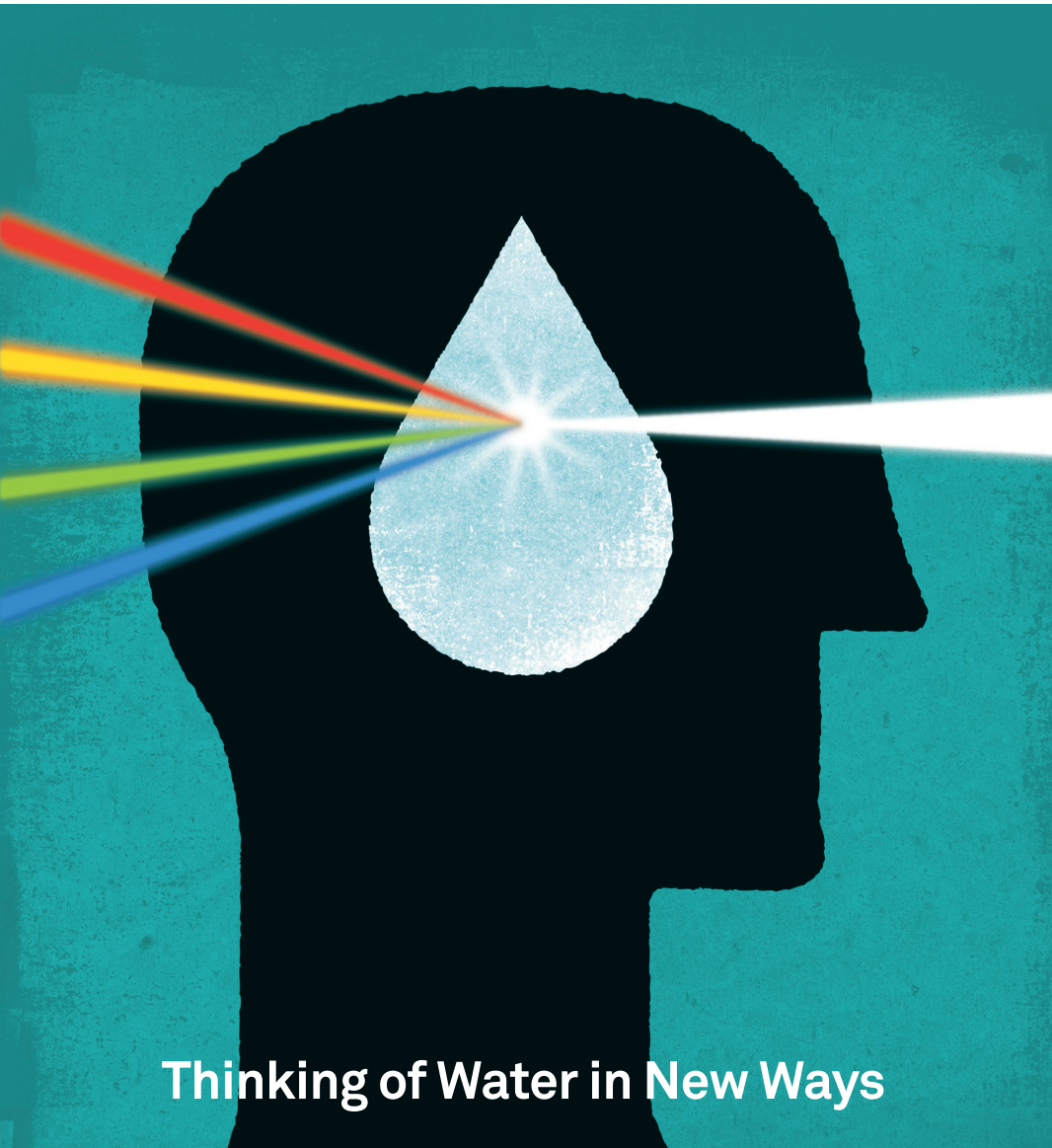
Brown AND Caldwell

# BC Today

SERVICE:
Drinking Water



## Thinking of Water in New Ways

# Glass Half Full:

## Water Suppliers See Emerging Opportunities

Water planners and utility managers have a lot of challenges on their minds these days. Constraints on traditional water sources, health concerns about an expanded array of contaminants, and more complicated regulatory requirements aimed at water quality must be addressed against a backdrop of funding challenges, looming infrastructure renewal needs, and future uncertainties.

In response to these collective issues, many water suppliers are discovering new ways of getting more done with less, and finding that they already have other means of developing sustainable, secure water supplies waiting to be tapped.

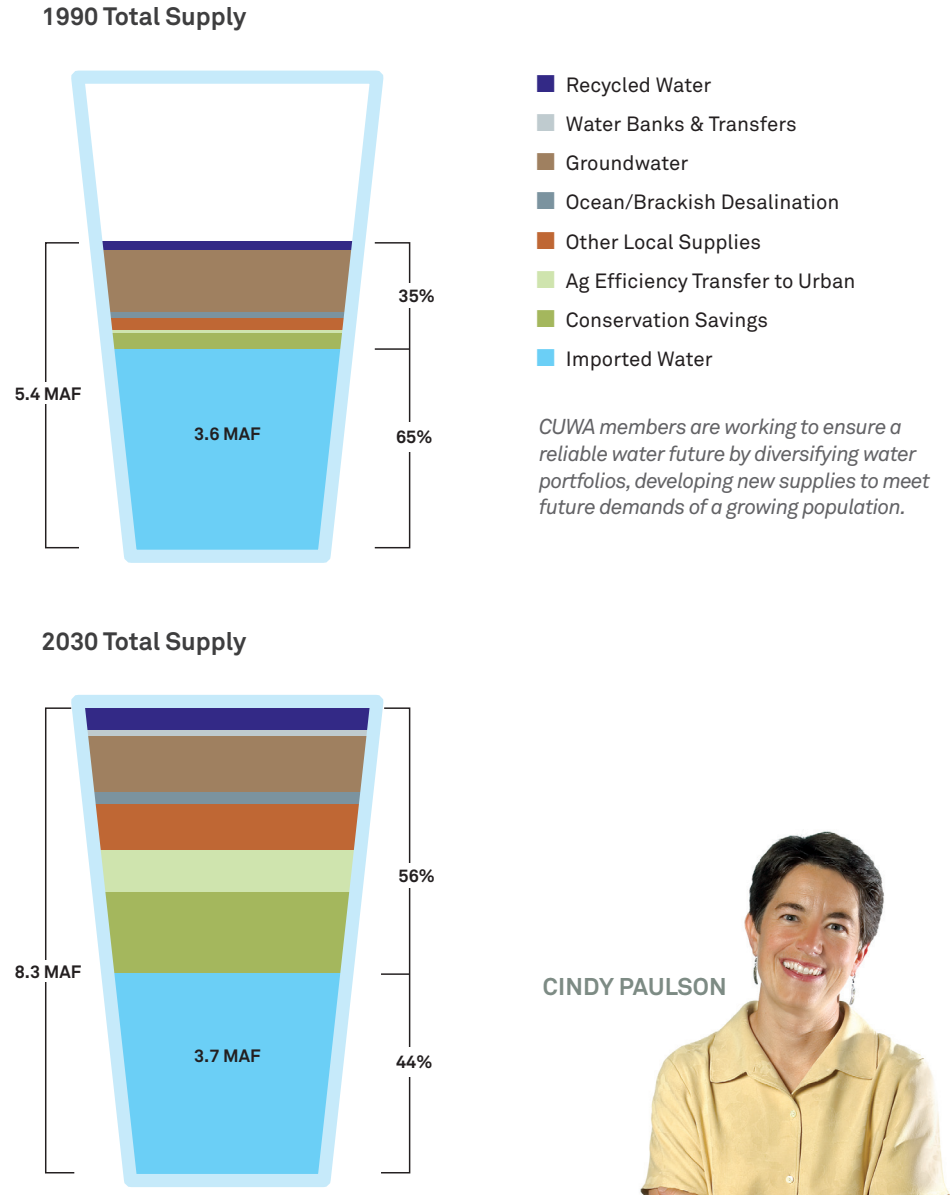
"We're seeing many water agencies begin to bring the multiple facets of water together to get more from existing and developable local assets," says Cindy Paulson, Senior Vice President for Brown and Caldwell. "They're able to improve reliability by doing more with what they have. They're showing their customers that there's much more to their water than most people realize. As a result, they are getting public support to use recycled wastewater, treat compromised groundwater and increase stormwater capture to be less dependent on imported water and its uncertainties."

Paulson drove this point home recently, speaking to the California Legislature on behalf of the California Urban Water Agencies (CUWA). That group, a non-profit organization of 10 urban water agencies that deliver water to two-thirds of the state's population, is working collaboratively to diversify and increase the reliability of water supplies (see accompanying graphic). "CUWA agencies are looking at alternatives and non-traditional sources that would not have been considered feasible just 10 years ago," Paulson says. "The result is more creative solutions and joint efforts to find workable outcomes."

One example is the $11.5 million Groundwater System Improvement Study and Groundwater Treatment Conceptual Planning that BC is conducting for the Los Angeles Department of Water and Power in the San Fernando Basin. This project will clean up groundwater impacted by historical industrial operations to maximize the pumping capacity of the groundwater supply in the basin. "In decades past, a project like this would not have been considered cost-effective, but now it represents a trend for the future—doing more to develop reliable drinking water sources in your own back yard," says Marc Damikolas, BC's Southern California Area Leader.

"Water is scarce, money is tight, and regulations are tougher," comments Bill Persich, Managing Engineer in BC's Seattle office. "These factors, plus better science on the health effects of emerging contaminants, are pushing utilities toward more intensive and advanced treatment. To do it affordably while ensuring improved water quality, that's the challenge." A case in point is the City of Ocean Shores, Wash., which had long struggled with difficulties in treating available groundwater sources and now faces

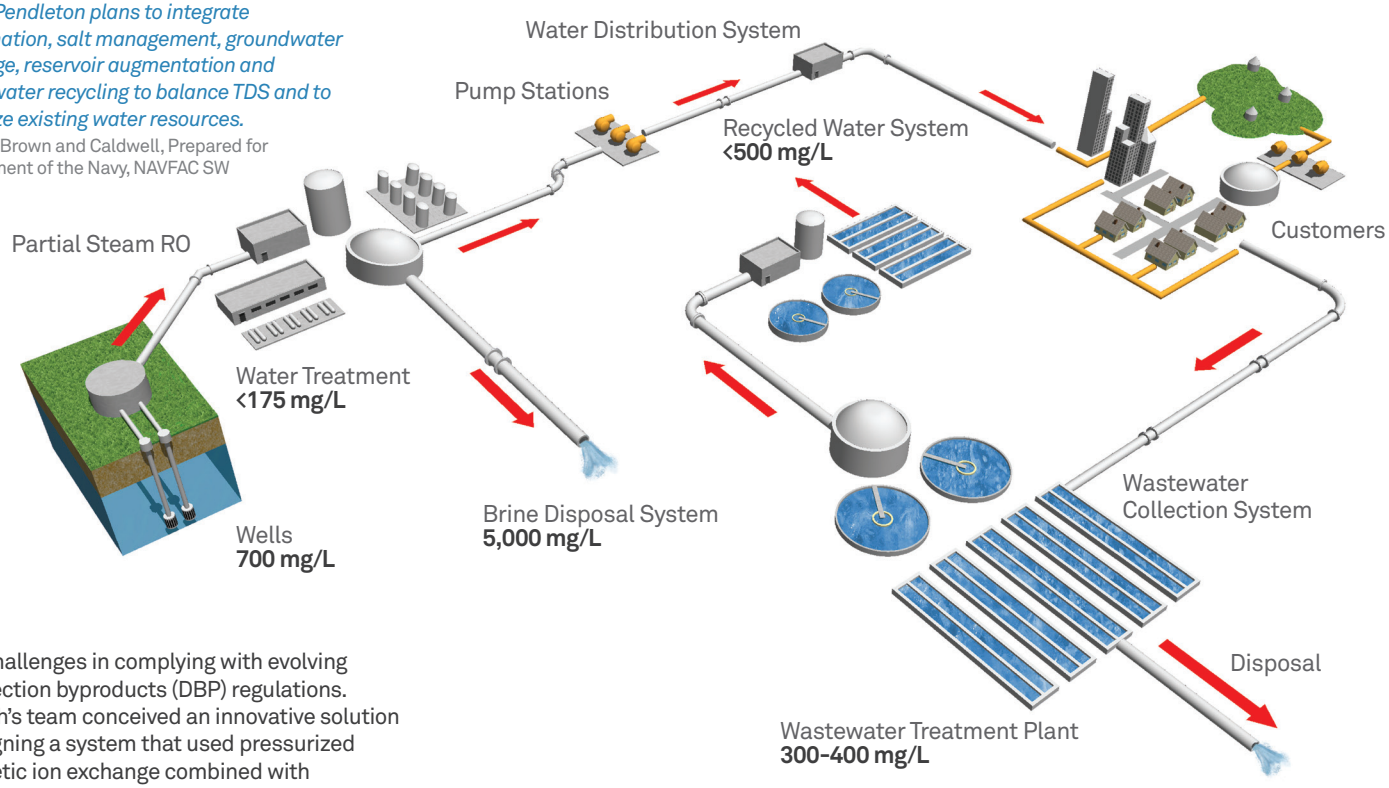
### Diversified Supplies to Improve Sustainability




*CUWA members are working to ensure a reliable water future by diversifying water portfolios, developing new supplies to meet future demands of a growing population.*

CINDY PAULSON

*Camp Pendleton plans to integrate desalination, salt management, groundwater recharge, reservoir augmentation and wastewater recycling to balance TDS and to optimize existing water resources.*
Source: Brown and Caldwell, Prepared for Department of the Navy, NAVFAC SW




new challenges in complying with evolving disinfection byproducts (DBP) regulations. Persich's team conceived an innovative solution –designing a system that used pressurized magnetic ion exchange combined with greensand filtration. "We were able to save money and to resolve taste, odor, color, and operational problems that had plagued this system for decades, while at the same time dramatically reducing DBPs," Persich says. "Cost-effective technologies are available and applying the right ones creatively will be even more important in the future."

Collaboration is an emerging theme all around the country in this new thinking about water, according to Nigel Grace, a Vice President in BC's Southeast drinking water team. "In water resources-limited areas, we are seeing growing interest in regional and inter-agency solutions, as well as in projects that put recycled water to work as an alternative supply," says Grace. "Utilities that previously fought over water rights are now sharing supplies for mutual benefit. They realize they can't build their way to sustainability, and even if they could, it's more cost-effective to cooperate than to go it alone."

A key to achieving a diverse and sustainable water supply is public support. "Agencies that can articulate the true value of water and their community's drinking water challenges are finding their ratepayers are more accepting," says Jo Ann Jackson, BC's Water Reuse Leader. "When customers understand, for example, that reusing treated wastewater is a cost-effective way to protect drinking water supplies and make the community less dependent on outside sources, they can embrace it."

At the Marine Corps Base at Camp Pendleton near San Diego, the U.S. Navy—with extensive planning and preliminary design support from BC—is developing a new drinking water system to maximize reuse and conserve potable water. The project involves planning, preliminary design, design-build procurement, and startup and commissioning of two water treatment plants, potable water conveyance system, recycled water system, desalination and salt, and water quality management. "This project has won widespread support from surrounding communities, military and environmental leaders," says Brett Farver, BC Senior Water Treatment Manager. "It secures a sustainable drinking water supply for our troops, protects local groundwater sources from saltwater intrusion and improves the health of the Pacific Ocean."

As important as a sustainable, reliable supply of drinking water is the challenge of aging water infrastructure, which the American Water Works Association highlighted in its February 2012 report, *Buried No Longer: Confronting America's Water Infrastructure Challenge.* The report predicts a $1 trillion price tag for

BRETT FARVER

needed repairs and replacements by 2035 that could triple a typical family's monthly water bill. "Our clients are being proactive in tackling this challenge head on," reports Gary Skipper, leader of underground infrastructure management at BC. "We are seeing investments in programmatic approaches to fully understand the actual scope and extent of the aging systems problem, as well as in new tools and technology to assess, manage and implement rehabilitation and replacement in a prioritized way. This doesn't mean that we don't have work to do to bring the public along, but we believe in the collective creativity and ingenuity of water professionals to solve this problem. We can do it, and there is a lot of good work going on to lead the way."

This issue of BC Today is a compendium of ideas for addressing drinking water challenges in new ways. Read on, and you'll find examples of how utilities are integrating, innovating, collaborating and optimizing to successfully address drinking water quality and reliability concerns. Some of the approaches are not new, only more relevant in the current context, taking into account shared responsibilities for water supply sources and water management, as well as for effective pollution control and environmental protection.

The good news? Today's challenges mean that exciting opportunities are surfacing for communities to secure sustainable water futures by harnessing resources already present, but previously unseen, in the water spectrum.

NIGEL GRACE

# New Thinking Creates Fresh Solutions

## Integrate

A holistic view across the water spectrum presents opportunities for meeting objectives for drinking water mixed with other resources and strategies such as reuse.

JO ANN JACKSON

**PROJECT:**
Alternative Water Supply Study

**CLIENT:**
City of Sunrise, Fla.

To address tight restrictions for drawing water from the Biscayne aquifer, BC evaluated the potential for using reclaimed water to provide drinking water offset credits and increase the city's permitted drinking water withdrawal capacity. A unique hydrogeologic approach evaluated the benefits of connecting specific customers to a reclaimed water supply and abandoning their existing wells, surface water supply or potable supply for irrigation.

**PROJECT:**
Recycled Water Study

**CLIENT:**
City of San Diego, Calif.

One of the first plans of its kind, this visionary project calls for the diversion of wastewater from the Point Loma Treatment Plant to upstream recycling facilities for non-potable, indirect and direct potable reuse. The study won the support of environmental groups concerned about discharges into the Pacific Ocean through the Point Loma outfall. The plan includes advanced treatment at the city's North City Water Reclamation Plant to augment supply at the San Vicente Reservoir for future indirect potable reuse.

## Innovate

Creative design solutions let utilities get more capacity and extend the useful life of current facilities, providing greater efficiency and value at less cost.

KELLY COMSTOCK

**PROJECT:**
Treatment Capacity Upgrade

**CLIENT:**
Grand Strand Water and Sewer Authority, S.C.

BC identified hidden capacity to allow cost-effective plant expansion from 40 to 60 mgd for Myrtle Beach, S.C.'s conventional ozone water treatment plant. An incremental solution to satisfy summer peak capacity needs was implemented in one year and will allow the plant to operate at 45 mgd. With a construction cost of slightly more than $1 million, the additional 5 mgd of capacity is achieved at a cost of only 20 cents per gallon.

**PROJECT:**
Shallow Aquifer Water Treatment Plant

**CLIENT:**
City of Ocean Shores, Wash.

BC designed the world's largest pressurized MIEX System with greensand filtration to remove dissolved organic carbon as well as iron and manganese, which had caused taste, odor, color and fixture staining complaints for decades. The project cut the cost of the system by some 40 percent over a proposed membrane solution, and has vastly improved the city's customer satisfaction.

BC professionals are uncovering drinking water solutions to help agencies address today's supply and financial challenges—integrating, innovating, collaborating and optimizing to fully tap existing assets.

## Collaborate

Partnerships and regional cooperation are generating more benefits than could be achieved by individual agencies or stakeholders.

MIKE PRETT

**PROJECT:**
Lake Oswego – Tigard Water Partnership

**CLIENT:**
City of Lake Oswego, Ore.

BC is leading the $230 million program to build six critical drinking water facilities in an aggressive five-year time frame. The improvements will allow Lake Oswego and Tigard, which formed an intergovernmental agreement for this effort, to address projected capacity deficiencies in Lake Oswego, secure Lake Oswego's unused portion of existing water rights on the Clackamas River, and enable Tigard to acquire an ownership stake in its water supply facilities.

**PROJECT:**
Freeport Regional Water Pipeline

**CLIENT:**
Freeport Regional Water Authority, Calif.

This massive project improves water quality for the Sacramento County Water Agency and protects the East Bay Municipal Utility District from future water shortages. The result of a historic water rights agreement between the agencies, the project provides 85 mgd for Sacramento year-round and up to 100 mgd for EBMUD under drought conditions. BC designed 8 miles of large diameter welded-steel pipeline, flow control and other structures.

## Optimize

Doing more with less is not only "the new normal." It's a proven, time-tested strategy for optimizing facilities, capital and O&M costs.

CHRIS HILL

**PROJECT:**
Rehabilitation and Replacement Program

**CLIENT:**
Tampa Bay Water, Fla.

Prioritizing critical assets and infrastructure replacement/rehabilitation is the right prescription for aging systems and for optimizing future capital resources. BC helped Tampa Bay Water formulate a comprehensive program to assess the condition of its assets and plan for future R/R, including development of a Replacement Planning Model and related capital plan that anticipates funding requirements to ensure system integrity and reliability.

**PROJECT:**
Townsend Dam and Pump Station

**CLIENT:**
City of Greensboro, N.C.

A failing dam required the replacement of a pumping station to ensure the community's water supply during construction. BC engineers designed a system that used small, more efficient pumps to meet flow requirements, saving $1.5 million in capital expenses and reducing operating costs by using 30 percent less energy.

# BC supports Water For People and Engineers Without Borders through financial and volunteer contributions to projects around the world.

Go to **WaterForPeople.org** to learn more

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