

# A Proactive Approach To Protect Clean Water

By John Egan

The corporate slogan, “Better living through chemistry,” was widely used many decades ago to introduce a range of innovations designed to improve consumers’ lives. Now, well into the 21st century, a growing number of scientific, regulatory and legislative bodies—as well as some water providers—are thoroughly

assessing some of those chemically based innovations.

“Forever chemicals” in the water supply are attracting closer scrutiny from federal and state agencies. As scientific understanding evolves, California water providers are taking steps to ensure clean and safe water.

In one example of a larger trend, Orange County Water District is taking bold, proactive action to protect customers from human-made chemicals

called per- and polyfluoroalkyl substances (PFAS), which are ubiquitous in homes and businesses across the nation.

OCWD manages local groundwater for approximately 2.5 million Southern Californians served by 19 major retail water systems.

While actively participating in legislative and regulatory processes around PFAS, the water district is moving forward with the nation’s largest pilot program to test more than a dozen types of PFAS remediation technologies. The treatment testing is made more

urgent by dozens of local water system wells exceeding the state’s revised drinking water response level, above which the state recommends water providers close their wells.

## PFAS ARE EVERYWHERE

When you cook with non-stick cookware, you encounter PFAS. When you put on your water-resistant coat, you contact PFAS. When you order takeout, PFAS come into your home. Carpets use PFAS for their stain-resistant properties. Some personal care products—such as shampoo, dental floss, nail polish and eye makeup—contain PFAS.

PFAS have been widely used in consumer and industrial products since the 1950s,

which means those chemicals can be found in nearly every U.S. home and business. There are nearly 5,000 types of PFAS in use, according to the U.S. Food and Drug Administration. Their prevalence across the U.S. economy means there are innumerable ways people can come into contact with PFAS (see graphic on page 12).

## SCIENTIFIC UNDERSTANDING EVOLVING

In biomonitoring studies conducted by the federal government between 1999 and 2012, roughly 99% of those tested had a detectable level of PFAS in their bloodstream, according to a February 2019 EPA report, “EPA’s Per- and Polyfluoroalkyl Substances (PFAS) Action Plan on PFAS.” According to the agency, the tested population represented the U.S. population.

“PFAS molecules consist of many carbon-fluorine bonds, which are very strong and stable,” says Dustin Mobley, a process engineer in Black & Veatch’s water technology group. “These bonds are what give PFAS chemicals their desirable properties that enhance many everyday consumer products, such as oil- and water-resistant coatings. However, these bonds are also what make PFAS persist in the environment for very long periods, since they do not naturally degrade.”

A human epidemiological study, known as the C8 Health Project and carried



Jason Dadakis, Orange County Water District’s executive director of water quality and technical resources, on the job. Photo courtesy of Orange County Water District

out as part of a legal settlement, published probable health links between exposure to one specific PFAS—known as perfluorooctanoic acid—and high cholesterol, ulcerative colitis, pregnancy-induced hypertension and kidney and testicular cancer, according to Jason Dadakis, OCWD’s executive director of water quality and technical resources.

## REGULATORS, LAWMAKERS, CMUA FOCUS ON THE PROBLEM

Although the state and federal government have established lifetime health advisories on PFAS, which carry no penalty, there are no state or federal enforceable drinking water quality standards for the chemicals. But that is changing. Both the EPA and California have opened regulatory proceedings that could, in a few years, lead to enactment of enforceable maximum contaminant levels for PFAS chemicals.

In February 2020, the

California Division of Drinking Water announced an administrative order on PFAS chemicals, lowering its response levels for PFOA and perfluorooctane sulfonate (PFOS) to 10 parts per trillion and 40 PPT, respectively. Previously, the state response level was 70 PPT for the two contaminants combined, equivalent to the current federal EPA lifetime health advisory. One part per trillion is equal to one drop of water in 20 Olympic swimming pools.

OCWD noted PFAS have been found in low concentrations in water supplies throughout the state.

The state’s Division of Drinking Water also kicked off a regulatory process to establish maximum contaminant levels for PFOA and PFOS this year. Public comment will be taken during this process.

The U.S. Environmental Protection Agency made a preliminary regulatory determination earlier this year to develop national drinking

water standards for PFOA and PFOS under the Safe Drinking Water Act. This represents the first step in the federal MCL process and is open for public comment.

CMUA and its members have supported several bills on PFAS introduced in the California legislature.

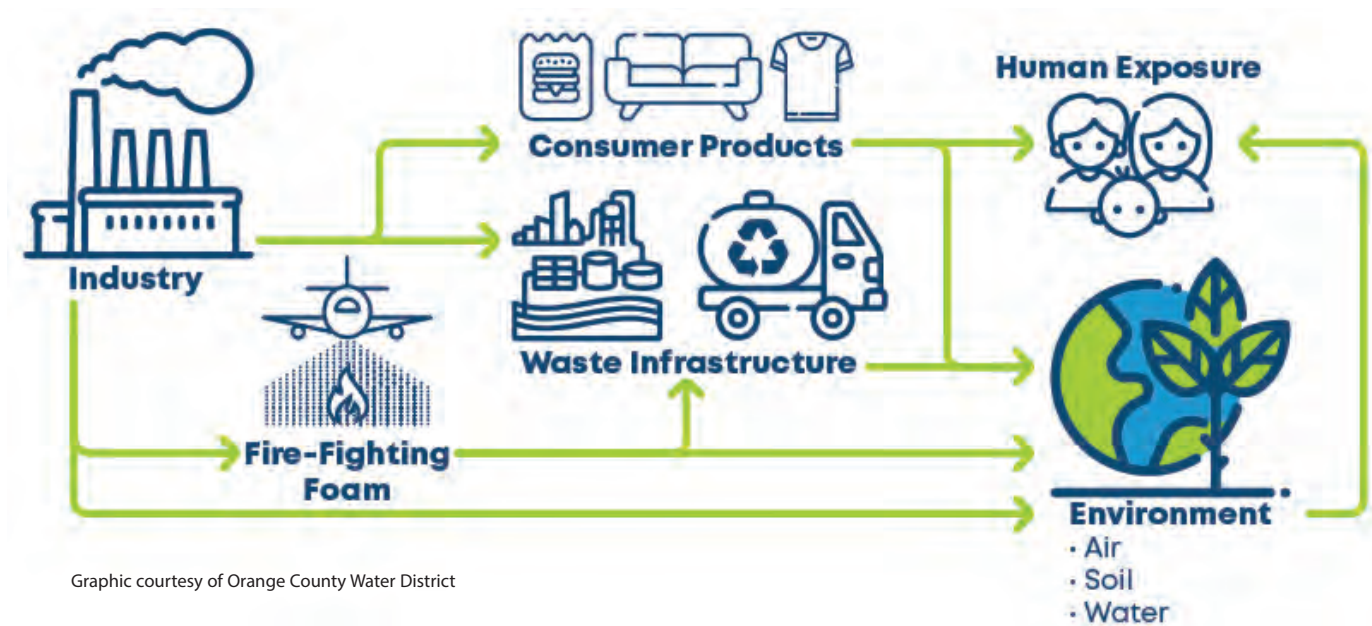
One bill, SB 996, is co-sponsored by CMUA and the Metropolitan Water District of Southern California. This bill would establish a statewide program to address constituents of emerging concern identified in the future. Another bill, SB 1044, addressed PFAS chemicals in firefighting foam. A third bill, SB 1056, would require state certification of a to-be-determined process to monitor PFAS more broadly. Due to COVID-19, only SB 1044 was moving forward as of June 2020.

State Sen. Anthony Portantino (See Power Player on page 18) has introduced all three bills.

A fourth bill, AB 2560,



Illustration by VectorMine



Graphic courtesy of Orange County Water District

co-sponsored by OCWD and CMUA, would establish a basic process for the State Water Board to follow when setting new notification levels and response levels.

“We’re working with our members, elected officials and regulators to better understand the science and enact measures that protect public health and safety,” said Danielle Blacet-Hyden, CMUA’s deputy executive director, who leads the association’s water advocacy team. “Cleaning up constituents of emerging concern like PFAS is a challenging problem and likely will have a very large price tag.”

### OCWD TAKES PROACTIVE STEPS

In December 2019, OCWD announced it was launching the nation’s largest PFAS treatment pilot program that would test 14 different treatment options to remove PFAS from groundwater.

While there are many uncertainties around the science and treatment options for PFAS, one thing is clear: The cost will be significant.

OCWD’s Dadakis estimated his district’s treatment costs at up to

\$850 million over 30 years. That includes capital costs (roughly \$250 million), operating costs (about \$450 million) and temporary replacement water costs (approximately \$150 million). Dadakis said it is too early to estimate the total statewide costs to lower or remove PFAS, except to say it likely would cost billions of dollars.

“We’re hoping this pilot program can identify the most effective and efficient PFAS-removal options,” he said.

Results are expected this summer, at which point the district will select its leading option. By early 2022, the first water-treatment systems will be operating. By mid-2023, all systems are expected to be operating, Dadakis projected.

OCWD is testing more than a dozen types of treatment options. Given the dispersed locations of the impacted wells within Orange County, rather than build one central water treatment plant, OCWD and its retail partners plan to install multiple stainless-steel cylinders measuring 12 feet around and 16 feet tall to treat groundwater from



PFAS water-treatment vessels.

Photo courtesy of Orange County Water District

up to 70 impacted wells.

In February 2020, two months after announcing its pilot program and immediately after the California DDW lowered its response levels for two types of PFAS, the affected retail water systems in Orange County began removing approximately 40 groundwater wells

from service and made arrangements for temporary replacement water supplies.

“These chemicals are ubiquitous, and the scientific knowledge still is in an early stage,” Dadakis said. “These are called ‘forever chemicals’ for a reason, and a lot of people are working to get their arms around the problem.” **CWP**