



AMERICAN WATER

WE KEEP LIFE FLOWING®

## R&D IN ACTION, 2021 CUSTOMER SOLUTIONS

### Water Loss

Loss of treated water through aging infrastructure is a major issue for the water industry globally. Our recently published research tested two technologies (continuous acoustic monitoring and satellite imagery leak detection) to identify water leaks beneath the surface in buried pipes. The study identified leaks in two water systems in California that would have resulted in 57 to 170 million gallons of lost water. Broader application offers important tools to address infrastructure efficiency and water scarcity.



# WE HELP KEEP INNOVATION AND RESEARCH FLOWING

At American Water, our primary responsibility is the delivery of safe, affordable, reliable water and wastewater services.

### RESEARCH & DEVELOPMENT

American Water's Research and Development (R&D) program differentiates us from our peers, with in-house scientific and engineering experts who routinely interact with and maintain relationships with external governmental, industry and environmental groups, including the United States Environmental Protection Agency (USEPA), Centers for Disease Control and Prevention and the American Water Works Association (AWWA), the American Public Health Association (APHA), and the Water Environment Federation (WEF). They also frequently collaborate with leading academic research labs.

The R&D group has participated in well over 100 Water Research Foundation projects. Some of the recent focus areas have included contaminants of emerging concern, water scarcity challenges, operational optimization, cost-effective treatment or mitigation strategies, desalination and potable reuse, with research findings regularly being published in peer reviewed journals and Research Foundation reports.

American Water's R&D team, along with the Environmental Leadership and Central Laboratory, report to the Chief Environmental Officer. The team's areas of focus include:

- Targeted R&D projects
- Regulatory tracking
- Proactive testing
- Risk-based preparedness
- Resiliency projects and alternate water supplies

### WATER QUALITY

The R&D team leverages our analytical capabilities to determine which of our systems may be impacted by emerging contaminants. In fact, we are immensely proud that the R&D team maintains a strong relationship with and provides input to the USEPA and Standards Methods Committee as federal standards and industry guidelines for safe drinking water are developed. Additionally, R&D staff actively participate in committees to contribute to the local and national research areas of importance. Some examples of projects are as follows:

- Coronavirus (SARS-CoV2), enteric viruses
- Legionella, Mycobacteria, Pseudomonas, Salmonella

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*(continued)*

- Campylobacter, E. coli O157, total coliforms
- Cryptosporidium, Giardia
- Nitrosamines & Disinfection Byproducts
- Lead and Copper
- Hexavalent chromium
- Distribution system modelling, water quality, biofilms management
- Leak detection
- Online monitoring tools and Emergency Response Protocols
- Customer Communications
- Flushing and Water Management Plans
- Microplastics
- Antibiotic Resistance
- Disinfection strategies (chlorine, chloramines, UV disinfection)
- Biofiltration, membrane bioreactors
- Potable Reuse (indirect/direct)
- Desalination
- PFAS Treatment
- Sources and Treatment for Taste & Odor causing Compounds

## THE CENTRAL LAB

Our R&D program is also supported through an NELAP-accredited American Water Central Lab in Belleville, Illinois. Each year, the Central Lab processes over 30,000 samples, testing for over 220 different analytes, including emerging compounds that are not yet regulated in most states. Our lab is equipped with state-of-the-art microbiological and analytical chemistry tools for measuring water quality contaminants, various human pathogens and investigating alternative or advanced treatment technologies.

## ON THE CUTTING EDGE OF TECHNOLOGY

Another example of our advanced technology is the monitoring of our extensive infrastructure network. Mapping software such as Geographic Information System (GIS), machine learning technologies and drones make it easier to monitor our water infrastructure and protect water quality. We also use the GIS mapping software, which collects information about potential sources of contamination from various data sources and pulls it into a single contaminant information database for a defined area of interest.



## R&D IN ACTION— CUSTOMER SOLUTIONS

### Legionella

When Pekin, IL experienced an outbreak of Legionella, a bacteria that can cause potentially life threatening illnesses, American Water sprang into action to apply a decade of research our R&D team had done on Legionella to determine whether conditions were suitable for microbial growth. When we looked at historic water quality data to see if any triggers existed for Legionella, we were able to confirm the problem was happening from an outside source, not within our systems. And, because of our research, we knew what to do to treat the problem and protect public health if we had found Legionella in our systems.

### Taste and Odor

The R&D team recently published a new paper on a method to measure Taste and Odor (T&O). It is open access, therefore expanding the impact and knowledge share of the work they do. The team has already been contacted by various external laboratories looking for guidance on this method and continues to develop tools to address customer concerns related to T&O issues.

### PFAS

Piloting the latest treatment technologies side-by-side for effective and affordable PFAS removal solutions, and are also evaluating the latest PFAS and contaminant destruction technologies.