Water Quality Could Change in Buildings Closed During COVID-19 Pandemic

While restaurants, gyms, schools, and other buildings have been closed to prevent the spread of COVID-19, the quality of water left sitting in pipes could change. The water could contain excessive amounts of heavy metals and pathogens concentrated in pipes nationwide, say researchers who have begun a field study on the impact of a pandemic-related shutdown on buildings.

“We don’t design buildings to be shut down for months. This study focuses on the consequences and could help building owners make sure that their buildings are safe and operational when occupants return,” said Andrew Whelton, an associate professor of civil engineering and environmental and ecological engineering at Purdue University in West Lafayette, Ind.

The researchers began their study upon receiving funding by the National Science Foundation’s Rapid Response Research program only three days after applying. The study involves monitoring water quality in buildings during a period of extended vacancy and when occupants have returned. This field study is part of a national effort to advise public health officials, building owners, and water utilities on how to safely recommission buildings with low or no occupancy due to the pandemic.

Purdue University engineering professor Andrew Whelton holds up a water sample from a faucet. The pink color indicates the presence of chlorine, a disinfectant. Whelton’s team is investigating how water quality might change in buildings during a time of limited occupancy due to the COVID-19 pandemic. *Purdue University photo/Matthew Kerkhoff*

Whelton and other researchers across the United States have begun drafting recommendations compiled by this effort. Collaborating with Purdue University are plumbing safety scientists and engineers from Virginia Polytechnic Institute and State University, Legionella Risk Management Inc., Arizona State University, the University of Memphis, the University of Iowa, Northeastern University, and Polytechnique Montréal in Canada.

The recommendations are based on implications from other studies of water stagnation in large buildings. Whelton’s team also worked with AWWA to publish a set of building recommission guidelines and provided guidance to a pandemic response in Detroit, Mich., as the city worked to restore water

service to thousands of households that had been shut off as a result of inability to pay.

“We’re not going to have all the science done at the end of this study,” Whelton said. “But part of what we’re trying to do is put energy toward helping others develop guidelines so that they can at least go in and start recovering their buildings.”

“With normal building use throughout a district, even small amounts of water use would help draw disinfectant residual into a building,” said Caitlin Proctor, a Lillian Gilbreth Postdoctoral Fellow at Purdue. “In the COVID-19 era, many low-use buildings in one area could affect the disinfectant residual in the water mains.”

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For this field study, Whelton's team is collecting samples at sinks and water fountains in three buildings to track temperature, oxygen, and heavy metals such as lead and copper, and to measure how microbial communities in pipes change over time.

The researchers are bringing together a network of organizations to be ready to act upon the study's findings when they are available. The findings are intended to help guide efforts by the US Environmental Protection Agency, the Centers for Disease Control and Prevention, and state and local government agencies. ●

Making Stronger Concrete With Steel Slag

Researchers have shown how a byproduct of steel production can be used to treat wastewater and make stronger concrete in a zero-waste approach that supports a circular economy, which is regenerative in nature, choosing recycling of resources rather than disposing of them.

Produced during the separation of molten steel from impurities, steel slag is often used as a substitute aggregate material for making concrete. Steel slag can also be used to absorb contaminants like

phosphate, magnesium, iron, calcium, silica, and aluminum in the wastewater treatment process, but it loses its effectiveness over time.

Engineering researchers at RMIT University in Melbourne, Australia, examined whether slag that had been used to treat wastewater could then be recycled as an aggregate material for concrete. The concrete made with post-treatment steel slag was about 17% stronger than concrete made with conventional aggregates, and 8% stronger than raw steel slag.

Author and water engineer Biplob Pramanik said the study was the first to investigate potential applications for

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In light of plans for phased reopening as part of Pennsylvania's strategy for addressing COVID-19, **Pennsylvania American Water** has encouraged building owners and operators to adopt a proactive approach that includes flushing stagnant water from facility pipes and ensures the presence of disinfectant residuals, adjustment of hot water temperature, and proper maintenance of building plumbing and heating/cooling systems. Extended periods of inactivity can cause lead leaching or *Legionella* growth in a building's water system, and taking proper steps can help minimize potential exposure to both of these contaminants.

While citizens have been sheltered in place during the COVID-19 pandemic, the **Henry County Water Authority** (HCWA; McDonough, Ga.) has seen the unintended consequences of a higher volume of wet wipes, rags, and grease in its sewer system. To maintain the integrity of residential plumbing (and septic tanks) as well as the sewer system, HCWA is asking residents not to flush any type of wet wipe or rag down the toilet. HCWA officials also have noticed an increase in the amount of fats, oils, and grease entering the sewer system. Rather than pour grease down the drain, residents are asked to let grease cool and pour it into a container that can be sealed and thrown away.

Xylem has expanded its Partner Community Grants Program to support customers and partners in the fight against COVID-19. **Xylem Watermark**, the company's corporate citizenship program, has invited customers and partners worldwide to nominate nonprofit organizations in their communities to receive grant funding for COVID-19 responses.

In addition, Xylem Watermark is partnering with Americares, a health-focused relief and development organization, to combat the

spread of COVID-19. The new global partnership provides personal protective equipment, water and sanitation infrastructure repairs, and education to frontline healthcare facilities around the world.

In light of US school closings and shelter-in-place orders in response to the COVID-19 pandemic that left millions of students at home and in need of more online educational resources, the **Groundwater Foundation** released a new series of free online lessons on the science of groundwater. The lessons cover a variety of groundwater information, from basic groundwater terminology and concepts to groundwater usage, how it becomes contaminated, and how people can help protect it. The lessons consist of worksheets and videos children can do on their own, plus more involved activities to do with an adult or older sibling.

Water For People was one of five organizations featured in an April 25 article by *New York Times* columnist and two-time Pulitzer Prize winner Nicholas Kristof. Through his C-19 Impact Initiative, Kristof highlights organizations that are fighting on the frontlines of the COVID-19 pandemic and encourages readers to support the efforts of these groups.

Japan-based **Kurita Water Industries**, a provider of water treatment products and services, has completed the merger of its consolidated subsidiaries in the United States, including US Water Services Inc., Kurita America Inc., Fremont Industries LLC, and Global Water Services Holding Co. Inc. The new company will be known as Kurita America Inc. and will be headquartered in St. Michael, Minn. By merging the four consolidated subsidiaries based in the United States, Kurita America has integrated sales, production,

“sewage-enhanced” slag in construction material. In the study, civil and water engineering researchers found that the chemical properties of the slag are enhanced through wastewater treatment, so it performed better when used in concrete.

Co-author and civil engineer Rajeev Roychand said the initial study was promising but that further research was needed to implement the approach at a larger scale, including investigating the long-term mechanical and durability properties of enhanced slag.

The study, “Recycling Steel Slag From Municipal Wastewater Treatment Plants Into Concrete Applications: A Step Towards Circular Economy,” with RMIT School of Engineering co-authors Sujeeva Setunge and Kevin Zhang, was published in the

marketing, commercial offerings, and administration systems to maximize the overall efficiency of business operations to provide comprehensive integrated solutions to its customers.

Washington Suburban Sanitary Commission (WSSC)

Water’s commissioners approved Phase Two funding to continue design and construction of the Piscataway Bioenergy Project, located at the Piscataway Water Resource Recovery Facility in Accokeek, Md. Currently, WSSC Water’s five major water resource recovery facilities produce about 8,000 tons of Class B biosolids each month. With the addition of the green technology at Piscataway’s new facility, the amount of biosolids left over from the treatment process will be significantly reduced, as will the cost of hauling and disposal. The remaining biosolids will be cleaner (Class A), making the disposal process much easier and allowing the final product to be sold and distributed as fertilizer.

The American Council of Engineering Companies (ACEC) recently awarded five 2020 ACEC National Recognition Awards to **Gannett Fleming** project teams. The projects are the Buckeye Lake Dam Improvements project; the Delaware County Regional Water Quality Control Authority’s Pump Station 6; the I-95: Sections D10 and D20 project; the Long Island Rail Road Enhanced Station Initiative project; and the Pikes Creek Dam Rehabilitation project.

Woolpert has received the 2019 Google Cloud Specialization Partner of the Year Award for Location-Based Services. Woolpert was recognized for its achievements in the Google

January 2020 issue of *Resources, Conservation and Recycling*. 🌱

Texan by Nature Honors Conservation Efforts of Respect Big Bend Coalition

Texan by Nature, a Texas-led conservation nonprofit organization founded by former First Lady Laura Bush, recently announced that the Respect Big Bend Coalition has been named a 2020 Conservation Wrangler. The Conservation Wrangler program has recognized six innovative conservation projects in Texas for their science-based and

The Respect Big Bend Coalition was formed to balance protection of the culture and natural resources of Far West Texas with energy development in the region. *Photo: Cynthia and George Mitchell Foundation*

results-driven approaches to conservation, along with their ability to have a positive influence on people, prosperity, and natural resources. The five other projects honored with the Conservation Wrangler

designation are the Paso del Norte Trail, the Trinity Park Conservancy's Trinity River Conservation Corps, the Texas Brigades, Exploration Green Conservancy, and Texas Children in Nature.

BUSINESS BRIEFS

Cloud ecosystem, helping joint customers deploy and optimize their location-based services, developing an online customer assistance system and cloud information portal, more than doubling its staff to support customer needs, and supporting all location-based data efforts with its extended geospatial team.

NACE International's members have voted to approve the association's proposal to combine with **SSPC: The Society for Protective Coatings**. The vote came after more than a year of discussions between the member leadership of both organizations and a unanimous vote this past March by NACE International's board of directors in favor of a resolution to bring the combination to a member vote. Initial efforts will be focused on determining the new governance and membership structure by Jan. 1, 2021.

The Capital Regional District (CRD; Vancouver, B.C.) has awarded **Carl Data Solutions'** wholly owned subsidiary **FlowWorks Inc.** a multi-year contract to provide wastewater flow data analytics software for the CRD Core Area flowmeter network. The data from these meters are used for operations, modeling, capital planning, cost apportionment and billing, compliance monitoring, inflow and infiltration measurements, and reporting.

In addition, FlowWorks has partnered with the **Hach Co.** US Flow Division to provide additional monitoring services to Boulder, Colo. Hach has partnered with FlowWorks to provide Boulder with tools to perform infiltration and inflow analysis, set alarms, and transform existing raw data into actionable information through a single internet interface.

Merrick & Co. has earned a National Recognition Award for exemplary engineering achievement in the American Council of

Engineering Companies' 53rd annual Engineering Excellence Awards for the Platte River Run Park in Sheridan, Colo. As the lead design firm, Merrick focused on overcoming low-flow conditions to create a resilient river channel that provides habitats and water recreation without affecting flood control and has the capacity to support a surf wave amenity for whitewater enthusiasts. The design involved hydraulic modeling, bank stabilization measures, and integration of river structures to sustain the active waterway without promoting erosion or compromising safety.

The City of Houston (Tex.) is partnering with seven cities and water authorities to build a new southeast transmission line that will move up to 75 mgd of surface water from the Southeast Water Purification Plant. The water line will be built in four construction packages. **Lockwood, Andrews & Newnam Inc.** will serve as technical advisor, providing design and easement acquisition support services. Construction is scheduled to start in late 2022.

The Town Council of Chatham, Va., has renewed its contract with **Inframark LLC** to continue managing, operating, and maintaining its water and wastewater treatment plants. The 10-year agreement includes wastewater collection and drinking water distribution as well as other public works activities. Inframark will provide staff to perform the work, purchase the town's public works equipment, and maintain and replace equipment as needed. Inframark also will provide a number of capital improvements to the town's water and wastewater system.

Detection Services, in association with partner **Rezatec**, is using its satellite technology to monitor potential structural and

Far West Texas has seen the expansion of energy development—oil and gas, wind, and solar—sources of energy central to the Texas economy. To balance energy development with the need to conserve West Texas' cultural and natural resources, the Respect Big Bend Coalition was launched with support from the Cynthia and George Mitchell Foundation in 2019.

The mission of Respect Big Bend is to inspire and empower stakeholders to conserve resources and protect the communities of the greater Big Bend region of Texas while developing energy responsibly. Respect Big Bend pursues its mission by employing rigorous science, community outreach and education, landscape-scale planning, and economic development. ●

environmental changes at Hunter Water's Grahamstown Dam near Newcastle, Australia. Detection Services will provide an asset monitoring program to identify hotspots of terrain movement, soils saturations, vegetation growth, moisture levels, and structural movement.

In addition, Rezatec is deploying its satellite data technology to help the St. Johns River Water Management District map and monitor prescribed burn areas across large areas of Florida in the United States. The St. Johns District uses prescribed burning, along with other methods, to manage vegetation, which in turn helps with flood management.

Celeros Flow Technology has been launched as a standalone company following the divestiture by **SPX FLOW Inc.** of its Power & Energy division to an affiliate of funds managed by private equity company Apollo Global Management Inc. Celeros is focused on supporting customers operating in end markets such as conventional, renewable, and nuclear power; oil and gas; petrochemical processing; and water treatment.

Pacific Gas and Electric Co. (PG&E) has sold its Narrows Hydroelectric Project to Yuba Water Agency in Nevada County, Calif. Yuba Water also owns the nearby Narrows No. 2 Powerhouse just upstream. For decades, the two entities closely coordinated the operations of these facilities, including the flows. PG&E employees will not be affected by the sale. ●

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