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On a Mission

**JAMES HEMBREE SEES HIS DEDICATION TO
RECYCLING WASTEWATER AS AN ARTICLE OF FAITH**

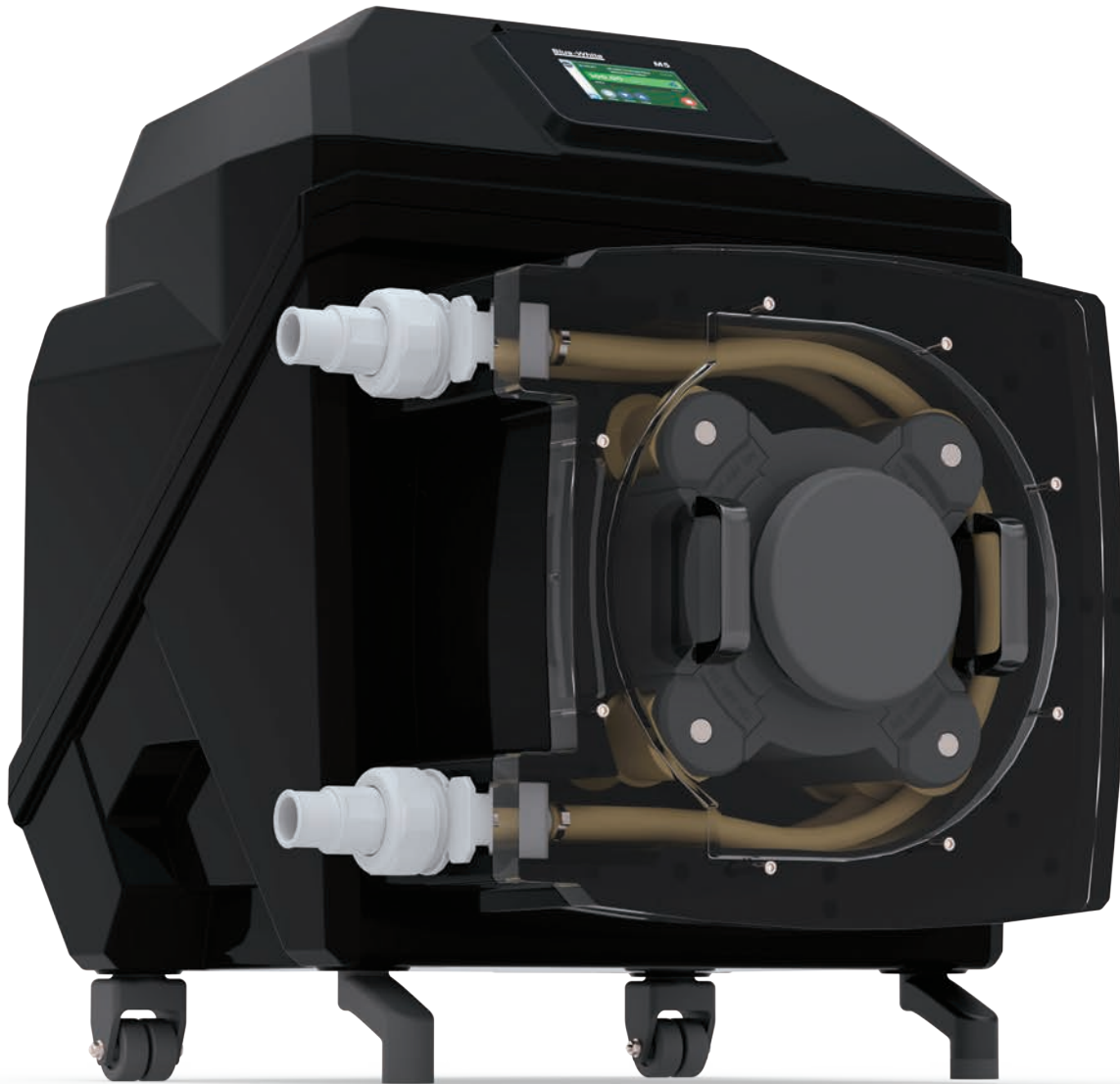
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James Hembree
Wastewater Treatment Operator
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ON THE COVER: They're not making any more water on earth, so we need to keep it clean and use it wisely. This sums up James Hembree's take on wastewater treatment. A Grade IV operator with the Hallsdale Powell Utility District, Hembree was named the 2021 Wastewater Operator of the Year by the Tennessee Association of Utility Districts. (Photography by Martin Cherry)
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let's be clear

How Ingenious Are You?

CLEAN-WATER AND DRINKING WATER OPERATORS SHOW CREATIVITY AND RESOURCEFULNESS IN FINDING SIMPLE AND LOW-COST, YET EFFECTIVE SOLUTIONS TO PLANT PROBLEMS

By Ted J. Rulseh, Editor



We hear this kind of story fairly often. Faced with a \$100,000 remedy for a treatment plant problem, the operations team finds a way to solve it for \$5,000 or less.

Both the Water Environment Federation and the American Water Works Association have ways to recognize operating teams for that kind of cleverness and creativity. WEF calls it the annual Operator Ingenuity Contest and announces the winners each year at the WEFTEC conference.

AWWA calls it the Gimmicks & Gadgets Contest. Winners are featured each year in the October issue of the association's *Opflow* magazine and are honored at the Water Infrastructure Conference, also in October.

You can enter these contests by following instructions found on the organizations' websites (see below). By taking part, you can earn recognition for yourself, your team and your community or utility while inspiring others in the profession to put their ingenuity to work.

WEF WINNERS

Here are some of the 2021 Operator Ingenuity Contest winners:

Goodbye I/I Award. Seven inventors from the Truckee (California) Sanitary District found a simple way to stop inflow and infiltration from manholes. They found significant I&I coming from the annular space between the cast iron frames and covers. As a fix, they applied a bead of pipe thread compound to the frame, making the annular space watertight. Those involved were Matt Ruge, Ryan Clifton, Rene Lopez, Mike Donchez, Eric Sundale, Ray Brown and Blake Tresa.

Mixing It Up Award. Mickey Groves at the Cripple Creek wastewater treatment plant in Colorado invented a single jar stirrer to run flocculated settleometer tests for process control. He made the device from two settleometers, a motor and a paddle from an old jar tester. The upper compartment is sealed and houses the motor. The lower compartment has two baffles that create turbulence to ensure adequate mixing. The tool is used for single-jar tests to verify correct chemical dosing.

Dosing in the Dark Award. Mike Hughes and Lani Somasunderam from the Lulu Island Wastewater Treatment Plant in Richmond, British Columbia, built a simple system to ensure continuous dosing of sodium bisulfite solution during power interruptions. It uses municipal water pressure with an eductor to draw a 38% solution from a drum. A solenoid valve on the waterline de-energizes to allow water to flow into the eductor. The chemical is then injected into the primary dosing discharge piping and flows into the existing diffuser.

Silt Blaster Award. Moyle Johnson from Bryce Canyon National Park in Utah came up with a quick way to clearing silt from valve boxes that had



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not been maintained. To clear them he used hydrant water pressure. He combined a 1.75-inch smooth-bore nozzle and valve with a 1-inch tip, a length of hose and a length of PVC pipe. Water from the nozzle breaks up the silt, dirt, rocks and debris and washes it all away.

AWWA WINNERS

Here are two Gimmicks & Gadgets award winners from 2021 as reported in *Opflow* magazine:

Swabbie Hand Pig. John Lins, utility incident manager with the Des Moines (Iowa) Water Works, developed this device for cleaning and disinfecting any length or diameter of pipe before it is installed in a main repair project. The device consists of a 4-inch-thick light foam swab that attaches to a mounting head and a handle. The swab is dipped in 1% bleach solution and then is pushed and pulled through the pipe to remove debris and leave a chlorine residual.

Meter Box Night Light. Mike Blake, a customer service specialist with the city of Central Point, Oregon, came up with an LED lighting system for a curb stop meter lid tool. The device recognizes the reality that flashlight can be hard to find in a nighttime emergency. This tool has one LED mounted at the end and another on the belly for inspecting or reading meters in the dark. They're operated by a single toggle switch. The retrofit cost just over \$5 and took about an hour and a half to complete.

To find out more about these ingenuity contests, visit:

- www.awwa.org/Publications/Periodicals-Proceedings/Gimmicks-Gadgets-Contest
- www.wef.org/resources/publications/all-magazines/water-environment-technology/operator-ingenuity tpo

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STOCKHOLM JUNIOR WATER PRIZE Canadian Student Wins

Annabelle M. Rayson from Canada has received the prestigious 2022 Stockholm Junior Water Prize for her research on how to treat and prevent harmful algae blooms. Crown Princess Victoria of Sweden announced the winner during a ceremony at World Water Week in Stockholm.

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RAILROAD STRIKE ENDS Chlorine Crisis Averted

The Association of Metropolitan Water Agencies recently voiced its support of an agreement between the railroads and their unions that prevented any interference of the shipment and delivery of chlorine and other essential water treatment chemicals. Read more about it in this online exclusive article.

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“OVERHEARD ONLINE

“Having accurate data and quality information is essential for water managers to make critical and timely decisions.”

Bureau of Reclamation Provides Grants to Improve Water Modeling and Forecasting

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THE CLEAN WATER ACT

A Half-Century of Miracles

The Clean Water Act's 50th anniversary is a time to celebrate a monumental regulatory success and huge progress toward fishable and swimmable waters. President Richard Nixon signed the Clean Water Act into law on Oct. 18, 1972, with the goal of making America's waters fishable and swimmable.

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On a Mission

OPERATOR JAMES HEMBREE LOOKS UPON HIS DEDICATION TO CLEANING AND RECYCLING WASTEWATER AS AN ARTICLE OF FAITH

STORY: **James Careless**
PHOTOGRAPHY: **Martin Cherry**

“The Lord God is not making any more water. It’s all being recycled. So we need to keep his water clean, and use the resources that he has given us wisely.”

This sums up James “Jim” Hembree’s take on wastewater treatment. A Grade IV operator with the Hallsdale-Powell (Tennessee) Utility District and its two wastewater treatment plants, Hembree has devoted his career to clean water. Since starting work in 1977, “I have just stuck to it and just tried to do my best to keep the water coming from our facilities clean and safe,” he says.

The fruits of Hembree’s labors were recognized with the 2021 Wastewater Operator of the Year award from the Tennessee Association of Utility Districts.

HISTORY OF SERVICE

Born in 1956, Hembree grew up in the Knoxville neighborhood of Fountain City. Public service runs in the family. “My father was the manager of the First Utility District of Knox County, my mother was a medical staff coordinator at a Knoxville hospital, and my sister was a supervisor for Knox County Schools,” Hembree says.

He attended Harrison-Chilhowee Baptist Academy in Seymour, Tennessee, from 1972-75. “After graduating high school, I went to work for the Tennessee Valley Authority as a forestry aide,” he says. There he surveyed logging trails and roads, worked on tree-cutting plots, and served as a fishery, wildlife and biologist assistant.



Tertiary filters at one of the Hallsdale-Powell Utility District’s two wastewater treatment plants.

In 1977, federal budget cuts hit the TVA. “The program I was in ran out of money, so I went looking for a new job,” says Hembree. “That brought him to his current place of employment.

45 YEARS LATER

In four and a half decades with the district, Hembree has worked his way up the ranks, gaining the practical experience and formal training to become a Grade IV operator, the highest level in the state. “When I started,

James Hembree has been working for the Hallsdale-Powell Utility District for more than 40 years.



RELAXATION TIME

When not cleaning water at work, James Hembree spends his time in the great outdoors.

“I have a dog. His name is Bud,” says Hembree. “I walk him quite a bit. He’s probably my best companion right now.”

Hembree and Bud walk around natural areas in suburban Knoxville: “We have a lot of wildlife, which I like to feed. I feed the birds, the chipmunks and the squirrels.”

Along with his friend Maynard Nordmoe, Hembree has done a lot of hiking. “We would go on backpacking trips in the Great Smoky Mountains,” he says. “We’ve hiked the big South Fork forest recreational area of Tennessee, and made trips to Olympic National Park in Washington.”

“I guess the last big hike we did together into the Grand Canyon, down to the bottom, along the river, and then back out again. I’m glad we did it, but I’ll never do it again. It was brutally hot down there!”

“I have just stuck to it and just tried to do my best to keep the water coming from our facilities clean and safe.”

JAMES HEMBREE



James Hembree,
Hallsdale-Powell Utility District
Knoxville, Tennessee

POSITION:
Wastewater Treatment Operator

EXPERIENCE:
In the field since 1977

EDUCATION:
**Studied business administration/management at
Pellissippi State Community College**

CERTIFICATION:
Grade IV Wastewater Treatment Operator

GOAL:
Produce the cleanest water possible, day in and day out

The team at the Hallsdale-Powell Utility District includes, from left, Ryan Barker, intern; Stephen Skeen, lab technician; Rodney Hensley, maintenance technician; Todd Dykes, superintendent; John Carroll and James Hembree, operators; Scott Hewitt, chief operator; Jessie Burnett, operator; Travis Collins, lab technician; and Tommy Meade, lab supervisor.



the Beaver Creek Wastewater Treatment Plant only handled 2 mgd which meant the operator was very much a jack-of-all-trades,” he says. “I did the maintenance work, the repairs and pretty much whatever needed to be done.”

Since then the Beaver Creek plant has been expanded and upgraded to process up to 9.7 mgd. A second facility, the Raccoon Valley Wastewater Treatment Plant, opened in 1974 and was renovated in 2013. It can process up to 300,000 gpd. Hembree is assisted in his work by a small but able staff. “They all call me ‘The Operator,’ because I’ve been here the longest,” he says. “But we all work together to do the job.”

His team includes James Callaway, Grade IV operator, and John Carroll, Grade II operator, plus Jason Beil and Glen Hagerman. “Todd Dykes is our superintendent,” says Hembree. “He’s very knowledgeable because he has a microbiology degree. Our chief operator is Scott Hewitt, who has also done a lot of courses and has become very knowledgeable. We also have a lab crew that handles testing for both our water and wastewater plants.”

COMPLEX SYSTEM

The district’s wastewater system is a complex combination of manholes, pipes, pumps and treatment facilities that serve some 22,000 customers. The district has more than 480 miles of sewer mains buried below its 146-square-mile service area. It also has 22 lift stations, 21 wastewater pumping stations, 9,753 manholes, and one storage tank.

The Beaver Creek plant processes the lion’s share of wastewater. Built in the 1960s, its liquid treatment facilities were upgraded in 2011, and the solids process was upgraded three years later by CTI Engineers. The upgrade included sludge thickening, which improved the aerobic digesters’ effectiveness while shortening run times for downstream dewatering processes.



James Hembree, shown checking the control panel on a centrifuge (Andritz), describes himself as a conservationist.

Hembree worked his way up the ranks, gaining practical experience and formal training on the way to becoming a Grade IV operator, the highest level in Tennessee. He’s shown inspecting the outlet of a drum thickener (Parkson Corp.).

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This plant has gone from belt filter presses to dewatering centrifuges (Andritz) that produce cake at about 25% solids, reducing hauling and landfill costs. A drum thickener (Parkson Corp.) is used to dewater the digesters before the material is centrifuged.

“They all call me ‘The Operator,’ because I’ve been here the longest.”
JAMES HEMBREE

The Beaver Creek plant is gravity fed, with an assist from Flygt pumps. “We have a Huber Technology screening system that removes solids, and then the wastewater is stored in our main tank before being sent to oxidation ditches,” Hembree says. “Sludge is sent to the digesters. When they are full, we aerate them, then extract the material, centrifuge it, and send it to landfill.” Beaver Creek also uses Kaeser blowers, and Wedeco UV disinfection systems (a Xylem brand).

The Raccoon Creek plant also uses aerobic digestion. A 2013 upgrade enabled it to handle more flow and still meet U.S. EPA and Tennessee Department of Environment and Conservation requirements. Screened wastewater is trucked from Raccoon Creek to the Beaver Creek plant for final processing.

“We have changed a lot at our plants over the years,” Hembree says. “For instance, our oxidation ditches used to have brush aerators, but now we use a Parkson waterjet aeration system. It sends smaller bubbles from the bottom of our storage tank to improve aeration and the overall flow.

“We have also improved our screening process and frequently come out on top when our effluent is compared to those produced by other wastewater plants in eastern Tennessee.” Both plants have received multiple awards from the National Association of Clean Water Agencies and the Kentucky/Tennessee Water Environment Association.

CAREER HIGHLIGHT

Hembree has overcome a variety of challenges, including dyslexia. Now after 45 years in the wastewater business, he has pretty much seen it all, but

when it comes to career highlights, one stands out: winning the Wastewater Operator of the Year award.

“To me, that’s a big deal because that shows how I have tried to do my best, even though I have failed from time to time,” he says. “So winning this award and getting to talk to so many people about my passion for clean water means a lot to me. It’s probably the biggest thing in this east Tennessee country boy’s work life!”

Hembree credits his faith for his success in life, along with the love of nature he first embraced while working at the TVA.

“I am a conservationist,” he says. “That’s just something that I’ve learned when I started working at TVA.” As for the future, “I plan to just keep doing what is right, and just praying that I can work until I’m 70. What keeps me going is the challenge of producing the cleanest water in all situations here in Powell, Tennessee.” **tpo**

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Wastewater Book Makes a Splash

HONOLULU'S WATER UTILITY CREATES AN AWARD-WINNING CHILDREN'S BOOK THAT COMPARES BODILY PROCESSES TO THE WAY A TREATMENT PLANT CLEANS WATER

By Sandra Buettner

When Markus Owens started working at the Honolulu Department of Environmental Services, he saw plenty of materials on recycling and trash, but nothing on wastewater.

As public information officer for the department, he set out to change that — by writing a children's book. "If you want to educate parents, educate the children first," says Owens, who joined the department in 2008. "Kids come home and tell their parents what they learned in school that day. They become great stewards for the rest of their lives and teach their own children to do the same."

The Department of Environmental Services treats about 107 mgd of wastewater for its more than 900,000 residents. The collection system includes some 2,100 miles of pipes and 72 pump stations. The wastewater is delivered to nine wastewater treatment plants spread over the island of Oahu and either owned or operated by the city and county of Honolulu.

SPLASH OF COLOR

Owens' 28-page book, *Anatomy of Wastewater*, has brightly colored graphics to highlight key points about the wastewater process and make the information accessible to kids. He wrote the words over a year, and an in-house artist created the graphics showing a Hawaiian family.

The book starts with the Aloha family enjoying a picnic at Kaka'ako Park in Honolulu. The young son, Kimo, asks his parents where his spam musubi goes once he swallows it. His mother, a doctor, and his father, a clean-water plant operator, realize that their explanations will be similar.

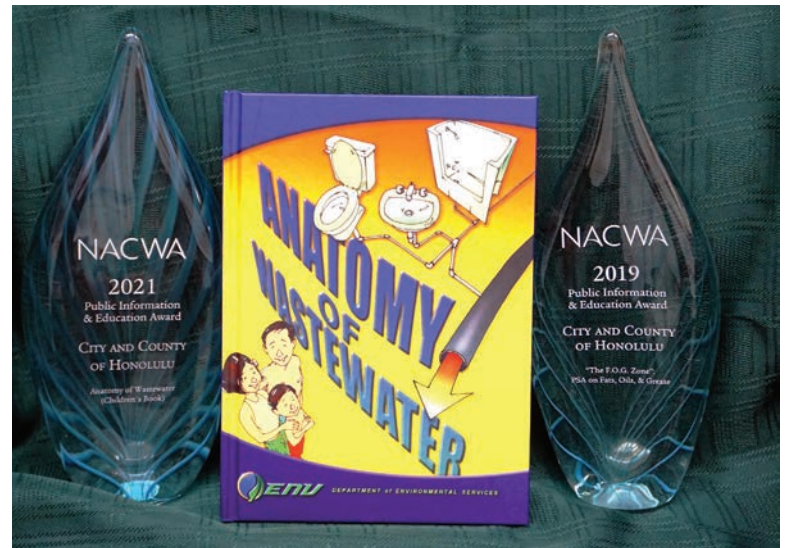
Mrs. Aloha explains that when Kimo eats, his body works much like the way wastewater is treated. The food goes through a long tube into his stomach, then passes through his large and small intestines. Along the way, the body keeps the nutrients and gets rid of the waste materials, all through chemical and biological processes.

Mr. Aloha tells Kimo that is similar to what happens at the treatment plant where he works: The water he uses at home goes down the drain or is flushed down the toilet; from there it goes through pipes to a pumping station and then on to the plant.

Large particles are filtered out and the water continues to a large holding tank where oils are skimmed off the top, and solids are scraped off the bottom. In the next step, microorganisms eat remaining solids. This step continues until the water is clean.

Kimo's dad then tells his son that the treated water is then released back to the environment, where Mother Nature further cleans it. He says a treatment plant is the last line of defense against water pollution.

The 28-page book has bright-colored graphics to highlight key points and make information about wastewater treatment understandable for kids.



GETTING IT OUT

The first printing of the book in 2011 was 10,000 copies at a cost of one dollar each. Funding came from the utility. Owens researched all the elementary schools and libraries on the island and personally drove copies to them all. About 50 schools received copies, and so did five state libraries.

The department promoted the book on its website, in a news release and through social media. It has been distributed at trade shows and job fairs, and handed out at the department's offices for residents who stopped in.

In addition, during an office trick-or-treat for the neighborhood, parents who drop by with their children for candy can take a copy of the book, which is displayed on a counter. It became so popular that the department did a second printing of 7,000 spiral-bound copies.

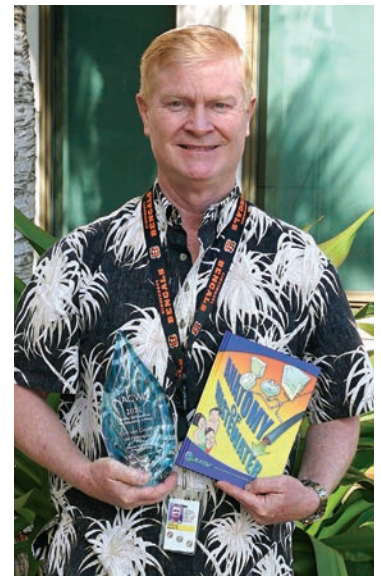
"Some parents comment that they still have the book from the years when they read it to one of their older children," says Owens. "It is rewarding to know that it was so well received and memorable." There is no charge for the books, which are available in a digital version at www.honolulu.gov/rep/site/env.

AWARDING EXPERIENCE

Upon a suggestion from a colleague, Owens entered the book in the 2021 National Association of Clean Water Agencies awards competition. It won in the category of Public Information and Education for Printed Materials.

As schools reopened after the COVID pandemic, Owens received invitations to give presentations. He uses the book to help explain the department's services to the kids.

"Teachers are asking me back, so they must be enjoying the book, too," he says. "And that's a good thing." tpo



Markus Owens, public information officer, Honolulu Department of Environmental Services



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A Towering Presence

THE WATER TOWER, BASED IN GEORGIA'S GWINNETT COUNTY, ASPIRES TO PROMOTE RESEARCH, TECHNOLOGY INNOVATION, WORKFORCE TRAINING AND MORE FAR BEYOND ITS STATE'S BORDERS

By Ted J. Rulseh

The water sector faces a set of persistent challenges: developing the workforce of the future, deploying innovative technologies, defining research needs and implementing projects, engaging effectively with local communities, and others.

A relatively new nonprofit organization looks to address challenges like those in its home territory around metropolitan Atlanta, and eventually in a wider geography. The Water Tower, launched in 2019, is based in Georgia's Gwinnett County, near the F. Wayne Hill Water Resources Center, which treats much of the county's wastewater.

The organization consists of two entities. The Water Tower at Gwinnett is responsible for the development and operations of the physical campus, while the Water Tower Institute carries on the organization's varied research and programming.

Together, these entities aim to create "a thriving ecosystem of water innovation fueled by imagination, informed by research, and powered by pioneers," according to the website at www.theh2otower.org.

They do this by bringing the public and private sides of the water industry together, along with academic institutions and other nonprofits, to tackle the critical challenges the industry is facing. Kristan VandenHeuvel, director of applied research and engagement, talked about The Water Tower in an interview with *Treatment Plant Operator*.

tpo: What specifically are the organization's areas of focus?

VandenHeuvel: We focus on four main areas: applied research, technology innovation, workforce development and community engagement.

tpo: What are the basic functions of the applied research area?

VandenHeuvel: We have labs on our campus where we can work with university partners and other collaborators. For example, if a university has visiting professors who would like to do research on our campus, we can work with them. In addition, over the past two years we have worked with stakeholders in the Lake Lanier watershed to develop a five-year research plan to protect and maintain the lake.

tpo: What is the significance of that Lake Lanier research?

VandenHeuvel: The metro Atlanta area gets the majority of its drinking water from Lake Lanier, and treated wastewater gets discharged back into the lake. So it's important to have that resource protected for generations to come. We worked with utilities on the lake, universities, environmental groups and regulators, to come up with a list of research needs. Then we took those needs and a list of questions to technical experts who helped us devise 32 applied research projects that we hope to implement over the next few years.

tpo: Where does technology innovation fit into your organization's work?

VandenHeuvel: Our focus is on companies coming up with novel

technologies. Historically, the water industry has been slower than some others to adopt new technologies, and for good reasons. There's the need to protect public health, and utilities may lack the resources or capital to pursue innovations. We created a space where companies can demonstrate their technologies, and where utilities can learn about them in a no-pressure environment.

tpo: How have you created that space to explore innovation?

VandenHeuvel: We have water piped in from the nearby F. Wayne Hill facility. We set the companies up with data and electricity so they can hook up their pilots or skid-mounted systems to those flows. They have access to our labs and different partner support at our facilities. It's a way to demonstrate the technologies and provide opportunities for utilities to see them.

tpo: What is your approach to helping develop the future workforce?

VandenHeuvel: We offer training for entry level water and wastewater operators, maintenance technicians and laboratory analysts. We work with the Georgia Water and Wastewater Institute, which is the state certification authority. They come to our campus to teach the 40-hour classes



Kristan VandenHeuvel

“We created a space where companies can demonstrate their technologies, and where utilities can learn about them in a no-pressure environment.”

KRISTAN VANDENHEUVEL

required for those positions, and we supplement that with hands-on learning in our field training center on campus, where folks can practice on heavy equipment. We also have a vault for confined space training, and different courses to augment the standard courses, helping students succeed not just in passing their exam, but also in the workplace.

tpo: Are there any innovative workforce development initiatives?

VandenHeuvel: We have the Water Workforce for Resilient Communities program, which serves people throughout our region who are in disadvantaged communities or have lost jobs due to COVID. We connect them with our training program, provide scholarships and supplement the required courses. Once they pass their exams, we have partner utilities that help place qualified candidates. That benefits the utilities in the Atlanta area because there are about 1,200 water-related jobs open. We hope this program will help people who are looking for stable careers.

tpo: Do you also reach out to other groups like high school students?

VandenHeuvel: We take part in many career fairs where we talk to

“We created a space where companies can demonstrate their technologies, and where utilities can learn about them in a no-pressure environment.”

KRISTAN VANDENHEUVEL

students about opportunities in the water industry. No matter their education level or their interests, there's a place in the industry for them. We held our first student-centric event on campus last September, called the Water Innovation & Leadership Summit.

tpo: What was the focus of the event?

VandenHeuvel: We brought high school students to the campus for a mini-career fair in the morning. In the afternoon we had hands-on stations that the students rotated through, at The Water Tower, F. Wayne Hill Water Resources Center and the Gwinnett Environmental and Heritage Center nearby. Between those locations the students saw many aspects of the water industry, sort of a day in the life of a plant operator.

tpo: What activities are included in community engagement?

VandenHeuvel: Our student events are part of that. Also, during the pandemic, we created a series of water-related videos where we interviewed experts across the country about what their work involves, why they chose the water industry, and the paths they took to get there. We sent those to schools for their digital learning days. We also have job shadowing programs and offer tours of our facilities. We have networking events for women called W3: Women, Water and Wine. We also do author events with water-related literature.

tpo: How would you describe The Water Tower's facilities?

VandenHeuvel: We have a 35-acre campus. Our main building has conference space for up to 250 people. In the lobby we can hold public activities and displays. We also have microbiology, analytical and experimental labs. There are three classrooms and five conference rooms. On the third floor we have tenants who are water-related companies. They get access to our conference rooms, labs and technology demonstration space. On our second level we have a co-working space with desks, touchdown stations, workstations and private offices for small companies or individuals working out of their house who might like to move to a new location and contribute to the projects we have going on.

tpo: What are you doing to reach out to a larger geography?

VandenHeuvel: Although we were born out of Gwinnett County and greatly appreciate them as a partner, we want to support utilities all around Georgia, the Southeast and beyond. No. 1 would be events like Demo Day where people can see new technologies and network. Our first Demo Day brought in utility and company representatives from several states. We're also working on a webinar program that will extend our reach. We do a lot of outreach on social media and through newsletters.

tpo: How can interested professionals find out more about The Water Tower?

VandenHeuvel: I would encourage them to check out our website, where they can find out about upcoming events and get information about our programs. We have some online courses that people can take even if they're not in our area. We hope to keep building a community of innovation and fostering an ecosystem here on campus and through our network across the United States. **tpo**

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It All Stacks Up

A UNIQUE THREE-STORY DESIGN, DEDICATED OPERATORS AND THE MARRIAGE OF NEWER TECHNOLOGY WITH TRADITIONAL METHODS ADD UP TO AWARD-WINNING PERFORMANCE FOR A GEORGIA WATER PLANT

STORY: **Suzan Chin-Taylor** | PHOTOGRAPHY: **Matt Odom**



The Tussahaw Water Plant treats up to 16.1 mgd in a conventional process.

The Tussahaw Water Plant has achieved a compliance record that many would envy.

This conventional surface water plant, owned by the Henry County Water Authority in Jackson, Georgia, has a unique building design. Since it was commissioned in 2007, its operations team has recorded water quality results that go above and beyond.

The approach is based on tried and true methods but applied with the latest technologies, while taking full advantage of on-site laboratory services. A strong leadership team and culture of communication enables this large facility (16.1 mgd capacity) to perform at consistently optimal levels.

UNUSUAL FOOTPRINT

The Tussahaw plant was created to serve growing needs in Henry County. Before it came online, its sister facility, the Towaliga plant in the western part of the county, served the utility's entire territory. The newer plant's primary source is the Tussahaw Reservoir. Systemwide storage includes four in-ground tanks and nine elevated tanks holding a combined 29.5 million gallons.

The treatment process is considered conventional, but it has unique design characteristics, most notably its architecture. Instead of a series

“All in all, it's a standard process. We like it because it's tried and true and reliable, and among the team there's a lot of institutional or industrial knowledge of its use.”

BARRY BRAND



The team at the Tussahaw Water Plant includes, from left, Tabby Lee, water quality and compliance supervisor; Eric Osborne, water production manager; Brandon Dubbs, operator; Sheila Kern, operator (now retired); Bridgett Graham, former water quality and compliance supervisor (has since left the organization); and Barry Brand, operations supervisor.

Tussahaw Water Plant, Henry County Water Authority

Jackson, Georgia
hcwa.com



of single-story structures and the large footprint that requires, Tussahaw houses all operations in a three-story building designed with aesthetics in mind. The bulk storage tanks are not outside in a traditional tank-farm configuration, but inside the structure, which upon approach gives the impression of an office building.

This configuration is also more convenient and comfortable for the operators because all maintenance and operations take place indoors, and team members don't have to travel from one building to another. That's desirable during Georgia's common rainy and hot weather. The building is home to not just plant operations but to administration and the comprehensive compliance testing lab.

The plant is operated around the clock in 12-hour shifts by Class I operators Brandon Dubbs, Steve Ledbetter, Michael Curry, Wayman Cody, Mike Bryant and Teresa Swan, and Class II operators Tammy Hawkins and Chad Hitzeman. Barry Brand leads them as operations supervisor.

NEW AND TRADITIONAL

One might describe the plant's treatment methods as conservative, but with a twist. "We have modern equipment, but we use older techniques such as alum, sodium permanganate and periodically pre-lime to adjust pH and alkalinity," says Brand.

The process oxidizes minerals, iron and manganese and creates floc that settles in large basins. The water is then filtered and bleach, lime, Carus Aqua Mag blended phosphate and fluoride are added. The finished water is stored in a clearwell and then sent to the storage tanks, from which it is pumped to the distribution system.

BUILT:
2007

POPULATION SERVED:
179,000

SOURCE WATER:
Tussahaw Reservoir

PRODUCTION CAPACITY:
16.1 mgd

TREATMENT PROCESS:
Conventional

SYSTEM STORAGE:
29.5 million gallons

DISTRIBUTION:
1,300 miles of water lines

OPERATIONS TEAM MEMBERS:
10

ANNUAL BUDGET:
\$7.5 million (Water Production Department operations)

"All in all, it's a standard process," says Brand. "We like it because it's tried and true and reliable, and among the team there's a lot of institutional or industrial knowledge of its use."

The plant is in a transition process to enable the delivery of more water from the Tussahaw water zone, which is in a low-lying point of the county, out into the county's far reaches. At present there are two pressure zones: Towaliga in the east and Tussahaw in the west. Pump stations move water in from one zone to the other. The goal is to move more water from the Tussahaw zone to the Towaliga zone as the eastern part of the county grows.

CLEAR AND SWEET

The Tussahaw plant doesn't experience extreme treatment issues, but its reservoir, like many in the Southeast, is low alkalinity with low turbidity.



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DRY TO WET

The Tussahaw Water Plant's unique three-story design houses all tankage, including the treatment chemical tanks, in the basement.

Over the past few years, the plant team decided to convert its dry lines for its powered chemicals to liquid chemicals for ease of handling, operator safety and better dosing control. The conversion came with a few challenges. For example, it was necessary to remove a section of the building's roof to lower the new lime tank into the building.

All in all, the decision was a good one. Operators can dose more precisely and without the presence of chemical dust that could be inhaled and irritating the eyes. The plant has realized savings on chemicals and for safety equipment: Use of respirators and goggles has been reduced.

The dosing is now performed by peristaltic metering pumps such as Watson-Marlow and Blue-White. Operators can easily adjust the chemical volume by way of the pump controls. It's another example of how traditional treatment delivered with innovative technology can improve efficiency, safety and treatment effectiveness.

This can be challenging to treat for iron and manganese, which can cause discoloration, taste and odors in the finished product.

The plant sees seasonal fluctuations with reservoir turnover; iron and manganese reach elevated levels in fall. This requires the operators to adjust



The treatment center at The Henry County Water Authority.

the treatment regime, typically by adding lime ahead of the filters.

The plant has awards including 2021 Best Operated Plant (Large Plant Category) from the Georgia Association of Water Professionals. It has achieved 15 consecutive years of perfect compliance with Georgia Environmental Protection Division requirements.

Explaining that level of consistency, Brand observes, "We test more than requirements call for. Our operators are exceptionally good at looking for and spotting trends. When they see a trend starting to develop in reservoir water quality or at the facility, we work on that long before it has a chance to become a permit issue."



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“ We test more than requirements call for. Our operators are exceptionally good at looking for and spotting trends. ... we work on that long before it has a chance to become a permit issue.”

BARRY BRAND

All this testing requires great laboratory facilities. Tussahaw has two labs. The process-control lab is used by operators for testing of the water from the reservoir, through the facility and out to customers. The compliance lab performs microbiological testing in the distribution system and monitoring of the reservoir anomalies or issues such as algae growth that may be coming to the plant.

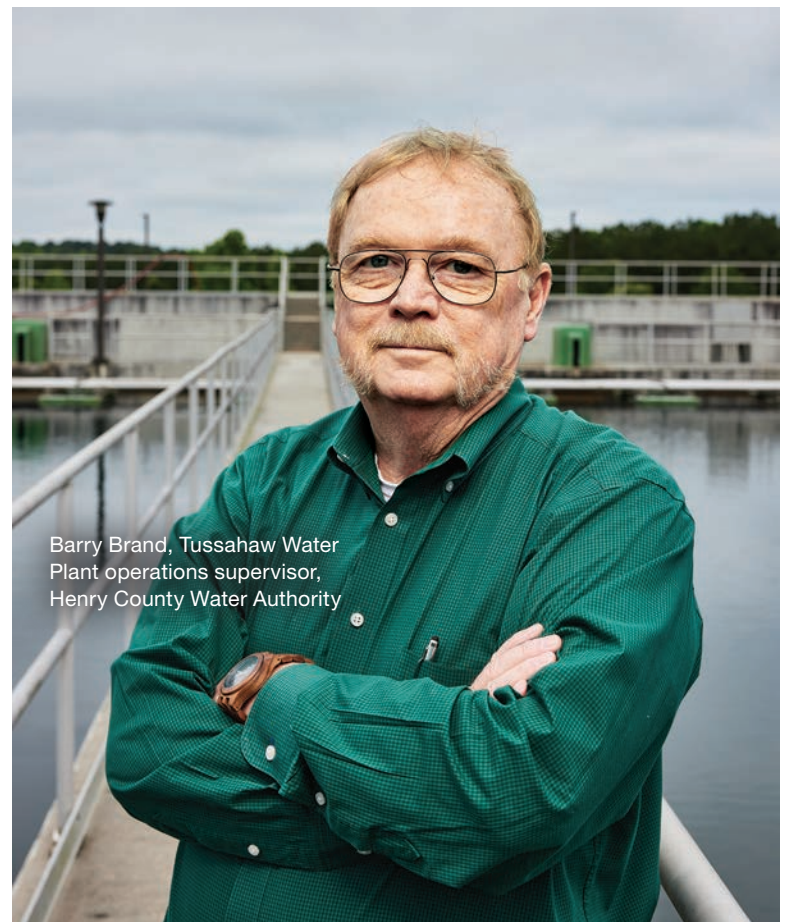
INFORMED DECISIONS

Brand’s team is also assisted by sophisticated operations software MVP Plant from CMMS Data Group. This computerized maintenance management software tracks all the operations, equipment, and maintenance. New equipment is entered into the program and a schedule for preventive maintenance is set for it.

The program generates work orders to schedule PM tasks and any corrective maintenance that may be needed. Data from the system allows Brand and his team to see if a given piece of equipment is having more repairs than normal or is costing too much to keep it operational. They can also monitor trends to determine when a device may have a high potential for failure.

“This data and history will prompt us to investigate why a particular item is having so many issues,” says Brand. “It might be that it’s simply at the end of its life cycle and needs to be replaced.”

(continued)



Barry Brand, Tussahaw Water Plant operations supervisor, Henry County Water Authority

LOWEST COST OF OWNERSHIP HIGHEST EFFICIENCY

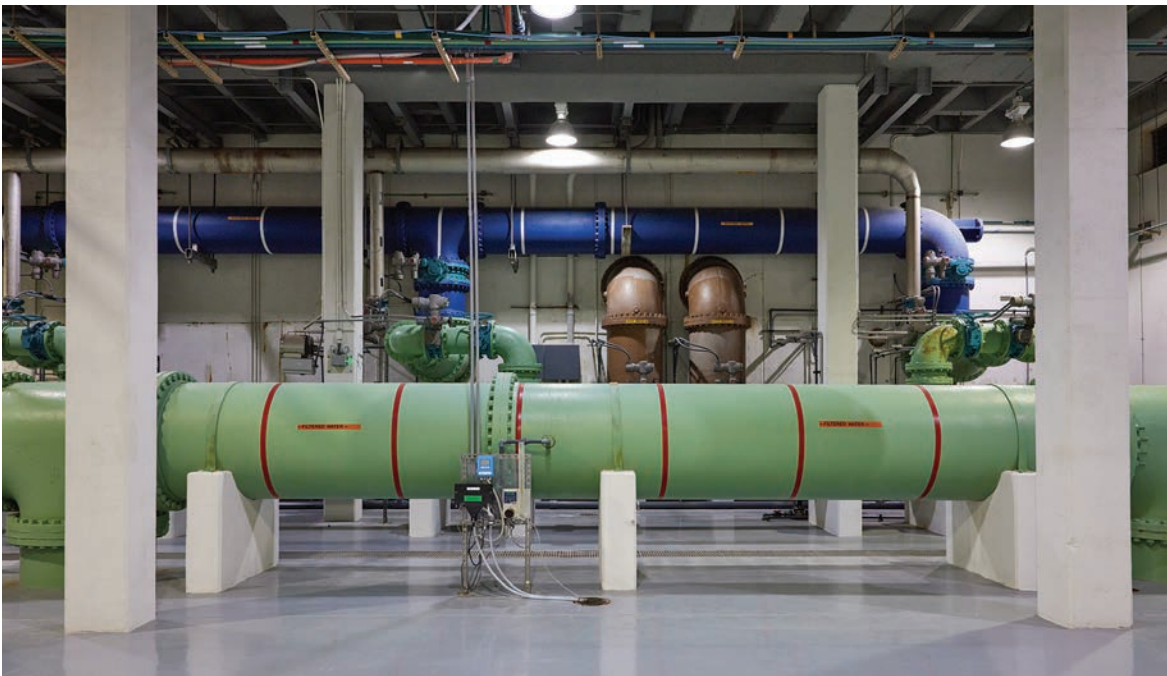
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A pump moves filtered water in the pump room. The small black box is a turbidimeter supplied by SWAN Analytical.

The county has a 30-year master plan that includes both water plants and helps guide plans for growth and needed updates. Data from the MVP software helps the county stay on target and adjust if something needs to be addressed or replaced earlier than scheduled in the plan.

The utility engages consultants periodically to evaluate and make recommendations based on growth in the area. The service territory, in the

“Data and history will prompt us to investigate why a particular item is having so many issues. It might be that it’s simply at the end of its life cycle and needs to be replaced.”

BARRY BRAND

South Metro area of Atlanta, is growing rapidly, and they watch carefully for equipment or infrastructure that will be needed to accommodate growth over the next 30 years.

The Tussahaw facility, designed as a 12 mgd plant, was upsized to 16.1 mgd without any capital expenditure. To do this, Brand and his team conducted a study of higher flows and higher rates through the facility, collected the data and submitted it to the local office of the state Department of Natural Resources, Environmental Protection Division. The staff there determined that the plant could handle the extra flow and so revised its permit.



Peristaltic chemical metering pump for liquid phosphate was supplied by Blue-White industries.



The high-service pump room at The Henry County Water Authority uses Goulds turbine pumps.

THE BEST ASSET

With all its tools, the laboratories, great facility design and support from its governing authority, Brand attributes the plant's success and recognition to its operators and their communication. "Keeping everyone on the same page is often a challenge," he says. "So I use everything available to me, such as operator logbooks and whiteboards in every room and hallway. That way, operators who encounter any issue can put a note at that spot."

Tagged emails, phone calls and in-person visits are also used, but most important is the follow-up by Brand to make sure everyone has received the message and is on the same page. That is the key to keeping things running optimally over the multiple shifts and around-the-clock operation.

"Talk to the operators and not at them," Brand advises. "Encourage feedback, even when it's unpleasant. That way you can have an open dialogue where you're not offended if someone tells you you're doing something wrong. You can make a correction before there's a permit violation."

Tussahaw's team has that level of communication; the team is consistently able to act before there is a costly problem. Taking ownership and pride in the product is the glue that holds all the elements together to keep this plant among the best in its class. **tpo**

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By Ted J. Rulseh

The Richmond Wastewater Treatment Facility was regularly meeting its permit limit of 1.0 mg/L effluent phosphorus.

The only trouble was that doing so required the addition of alum, which had once cost about \$250,000, upstream of the final clarifiers.

To address that issue, the Richmond Sanitary District installed large-bubble mixing systems to create anoxic zones in selected aeration basins as part of a \$14 million plant upgrade. The anoxic zones enable biological phosphorus removal and have nearly eliminated the feeding of alum.

CUTTING DOWN ON CHEMICALS

The city of Richmond lies in east-central Indiana next to the Ohio border. The sanitary district serves about 20 square miles in the city and surrounding Wayne County. Reducing chemical inputs has been a priority for the treatment facility, according to Todd Hobson, plant superintendent.

The large-bubble mixing systems were supplied by Pulsed Hydraulics, working with FACO, its Indiana distributor, and engineering consultant Donohue & Associates. The Richmond plant (18 mgd design, 8.9 mgd average) has an activated sludge extended aeration process with nine treatment



The Richmond Wastewater Treatment Facility has a design flow of 18 mgd. The stair-step configuration of nine aeration treatment trains is visible at the right.



Bubble-forming plates help generate large bubbles that mix the anoxic zones in the Richmond treatment plant's first-stage aeration basins.

trains, each with three passes labeled A, B and C, through which the flow proceeds by gravity.

The extended aeration equipment was aging and in poor condition, according to Larry Bell, vice president of sales with Pulsed Hydraulics. "Through the insight of plant operations management and the foresight of the city administration, they decided to go all in and improve the treatment facility and thereby improve the water quality going into the White River, while making the plant more energy efficient," Bell observes.

A THOROUGH MIX

To achieve biological phosphorus removal, the plant upgrade team created two successive anoxic selector cells in Pass A of each treatment train. Water exiting the primary clarifiers goes through a splitter box with automated valves that divide the flow.

The nine Pass A (first-stage) basins each have two 20- by 30-foot anoxic selector cells, followed by a third cell of the same size with fine-bubble aeration. From there the flow proceeds downhill through Pass B and Pass C, also fully aerated.

The key to effective phosphorus removal, notes Bell, is thorough mixing in the anoxic zones. That is accomplished by the large-bubble mixing systems. It may seem counterintuitive to mix an anoxic zone by feeding air. However, the large bubbles produced by the Pulsed Hydraulics mixing system (about 36 inches in diameter) have miniscule surface area and therefore minimal oxygen transfer when compared with billions of fine bubbles.

The large-bubble system uses oil-lubricated rotary-screw compressors that deliver 0.2-second pulses of 50-80 psi air by way of poppet valves. The air goes out into the basins through 1-inch piping to 8-inch-diameter bubble-forming plates — two such plates on the floor of each anoxic selector zone.

Pulsing valves deliver two to six pulses per minute. The naturally buoyant large bubbles rise at about 4 feet per second, lifting the water and solids in the tank. The bubbles exit to the atmosphere at the surface, at which point the water and solids radiate outward in a circle; gravity then takes over and the downward force continues the mixing action.

PROOF OF PERFORMANCE

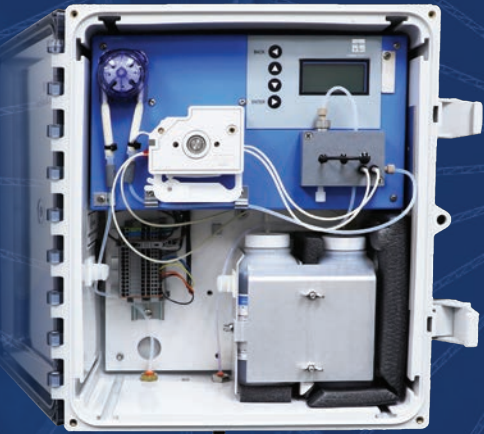
The sanitary district performed field testing on the Pass A anoxic selector cells. Testing was conducted at the center of each selector cell as representative of conditions in the rest of the cell, since the two bubble-forming



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plates have zones of influence that cover the entire cell area. Each location was sampled at three depths to verify the solids distribution.

Testing ran continuously for six hours while contractors were working with the gates in the flow splitter structures; this activity noticeably affected flows and therefore the waste loadings between the aeration basins immediately downstream.

In spite of this variable loading, the test data showed that the total suspended solids were evenly distributed in the anoxic selector cells, indicating that the large-bubble mixing systems were performing effectively.

In addition to the favorable TSS results from the testing, the dissolved oxygen measurements in all 18 selector cells were significantly below the 0.2 mg/L limit mentioned in the specification as the upper acceptable value for anoxic operation.

SIGNIFICANT SAVINGS

"The technology the city employed to achieve biological phosphorus removal is really nothing new," Bell observes. "A complete mix enables the plant for the first time ever to use all the tank volume available. The plant upgrade as a whole has reduced the energy bill by approximately one-fourth, and they no longer have to feed alum or other chemicals to achieve their NPDES permit phosphorus limitation."

Pat Smoker, sanitary district director, notes that before 2017, the district was feeding about 600 gallons per day of alum solution at the downstream end of the Pass C basins, just ahead of the channel carrying the flow to the splitter box that distributes the treated water to the four final clarifiers.

It was around 2017 when the district staff realized that, due to aging aeration infrastructure, the facility had accidentally created anoxic zones in Pass A basins — this allowed a reduction in the alum feed to about 100 gpd.

As the treatment plant upgrade was being designed, the goal was to set up controlled anoxic zones that would further reduce alum usage. As part of that design process, the large-bubble aeration system was ultimately selected.

"Right now, we're putting in about 12 gallons of alum per day, just because our permit says we have to do it," Hobson says. "We really don't even need it. We were paying \$5,280 per load of alum, and before 2017 we used to get a load every Friday. Now we get by with two loads a year." Annual savings on alum compared to pre-2017 costs total about \$250,000.

Effluent phosphorus averages about 0.37 mg/L, well below the 1.0 mg/L permit limit. Before the new mixing system was installed, effluent phosphorus averaged 0.7 mg/L.

“We were paying \$5,280 per load of alum, and we used to get a load every Friday.

Now we get by with two loads a year.”

TODD HOBSON

Maintenance on the large-bubble aeration system has been minimal, says Hobson. At the recommendation of Pulsed Hydraulics, the plant team periodically boosts the pressure and size of the air pulses in the basins to enhance the mixing and prevent buildup of grit in the basin corners. About every two weeks, operators clean the ORP meters installed to monitor conditions in the anoxic zones.

"It's a good system," Hobson says. "So far it has worked really well." **tpo**

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GRANULAR ACTIVATED CARBON AND REGENERABLE ION EXCHANGE UNITS ARE DESIGNED TO REDUCE “FOREVER CHEMICALS” TO NONDETECTABLE LEVELS WHILE ADDRESSING ISSUES WITH SPENT MEDIA DISPOSAL

By Ted J. Rulseh

Granular activated carbon and ion exchange are two technologies proven effective in treating waters that contain PFAS. One issue with both is that, as in other applications, the carbon or ion exchange resin accumulates the pollutants and then must be either regenerated or disposed of responsibly. De Nora now offers GAC and ion exchange treatments that reduce PFAS to nondetectable levels.

The company’s preconfigured SORB systems include a regenerable multi-use ion exchange technology now being pilot tested. It can be paired with electrochemical advanced oxidation processes, significantly prolonging resin use and reducing the need for media disposal.

The GAC and ion exchange systems are optimized locally depending on variables such as flow, seasonality and the targeted contaminants. The treatments are proven up to 99.99% effective with features designed to streamline processes from installation to operation, according to the company.

Units are configured with features that allow maintenance to be done from outside the tank, reducing the need for permits, added personnel or media removal. Nicholas Armstrong, product manager for organic and inorganic contaminant removal, talked about the treatments in an interview with *Treatment Plant Operator*.

tpo: How did these technologies fit into the realm of PFAS treatment?

Armstrong: Granular activated carbon has been used in industry for generations for multiple applications in organics treatment, and ion exchange

has been widely used for removal of inorganics. The systems we supply today are large steel vessels containing media that’s specific to removing a contaminant of concern. With PFAS, there is no silver bullet of technology. You have to look at the water chemistry and cater to the site-specific need.

tpo: How do your technologies deal with PFAS-contaminated drinking water?

Armstrong: We have standardized the product line to take some of the guesswork out of the system and vessels. Our GAC offering, SORB CX,

“Where you have a large amount of PFAS in the water along with other organic compounds, you can combine the two technologies.”

NICHOLAS ARMSTRONG

is effective on lower-challenge long-chain PFAS and for waters that contain other organic contaminants, such as chlorinated compounds and disinfection byproducts. Now with advanced analytical techniques that can identify more and more PFAS in drinking water, along with the updated advisories released by the EPA in June, the market is moving more toward ion exchange.

tpo: What are the advantages of ion exchange technology?

Armstrong: Ion exchange uses a synthetic formulated media that can be specifically tailored to target PFAS. Because of ion exchange properties in which positive and negative charges are attracted to each other, it can remove not only long-chain, but some short-chain PFAS.

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tpo: Can these two types of media be used in tandem?

Armstrong: Yes. Where you have a large amount of PFAS in the water along with other organic compounds, you can combine the two technologies. A GAC system up front does the heavy lifting and knocks out the organics, and ion exchange on the back end takes out the PFAS. Another advantage of ion exchange is that it has capacity for regeneration. The key is to identify how we go about destroying PFAS and what the destruction technique looks like.

“ Ion exchange with a destruction process on the back end is ultimately where we need to go.”

NICHOLAS ARMSTRONG

tpo: How are spent GAC and ion exchange media typically dealt with now?

Armstrong: Typically, the carbon and ion exchange media, once used and exhausted, needs to go to an incinerator to be destroyed. Whether that truly destroys the PFAS or just moves the problem from the water to the air is still an open question. Ion exchange with a destruction process on the back end is ultimately where we need to go. We want to concentrate the PFAS and then pass it through a process for destruction.

tpo: What is your company's approach to destruction of PFAS?

Armstrong: It is an electrochemical process that uses an anode and cathode reactor, formulated using a specific type of metal base and a proprietary coating. After concentrating the PFAS on the ion exchange resin beads, we use high-salinity water to rinse the PFAS off. Now you have a concentration of salinity and PFAS, and that's where this electrochemical process comes in.

tpo: What is the nature of the destruction accomplished by the electrochemical process?

Armstrong: It breaks the chain of the fluorocarbon bonds, and the resulting materials are absorbed into the coating of the reactor. So ultimately, you can have the ion exchange resin on site for multiple years without having to move it to a regeneration facility. An additional benefit is that the destruction process is not energy intensive. It is not a thermal process.

tpo: Is there still a waste product that needs special handling or disposal?

Armstrong: There is still a waste stream in the form of saline water. The expectation is that this water would simply contain chlorides and could either go direct to the drain or to treatment on the wastewater side.

tpo: Has the electrochemical destruction process been proven in the field?

Armstrong: While still in the early stages of development, it has been used in applications involving high concentrations of PFAS, like landfill leachate, and it has shown promising results.

tpo: What differentiates your PFAS removal offerings from other GAC and ion exchange technologies?

Armstrong: On the GAC side we use a carbon that is specifically formulated to optimize PFAS removal. It's a combination of carbons specified for the application. And on the ion exchange side we have the regenerable solution that we expect can pair with a destruction technology on the back end. Another differentiator is on the system design side, the optimization of flow through the media to deliver maximum removal.

tpo: How is the regeneration and destruction technology actually deployed on a site?

Armstrong: Much of that is still very much in the piloting stage. The expectation is that this process would be done as service, meaning that a mobile asset would come to site to perform the regeneration and destruction process. Ultimately, a cost analysis should be done to identify what is the right solution for each specific site. We believe our regeneration package will set the standard for the future, allowing utilities to promise safety for both water and the environment. **tpo**

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Brian Goetz, deputy
director for public works

Facing Down PFAS

BRIAN GOETZ COUNTS DEALING WITH A NEWLY EMERGED POLLUTANT AS JUST ONE OF THE CHALLENGES HE HAS FACED IN A SUCCESSFUL 35-YEAR WATER CAREER

STORY: **Jim Force** | PHOTOGRAPHY: **Adam Perri**

Rising costs. Tightening regulations. New contaminants. Increased public scrutiny.

The water-wastewater profession faces significant challenges, notes Brian Goetz, deputy director of public works in Portsmouth, New Hampshire.

He should know. His utility has been addressing PFAS contamination in a part of the city's water supply since May 2014. Parts of the city's water system are 200 years old. The high cost of housing and growing complexity of the jobs make it difficult to attract new qualified treatment operators.

And Goetz doesn't sugarcoat his opinions: "I can't think of any working profession that's less understood today than water and wastewater treatment. I love my job, but there's enough work here for two or three people."

DECADES OF EXPERIENCE

Goetz is from Ohio and earned his bachelor's degree in technology from Bowling Green State University. Later, he obtained a master's in environmental policy from Indiana University. All told, he has 35 years of experience in the water professions.

His first position was with Indiana American Water. Then, after several years in consulting, he took a position managing American Water operations at Hampton, New Hampshire. After that he worked as an engineering consultant around New England for eight years until Portsmouth hired him for his current role nine years ago.

Today, he is responsible for the city's water, wastewater, and stormwater systems. His divisions consist of about 70 full-time equivalent staff members and combined budgets of over \$35 million.

DIVERSE OPERATIONS

The Portsmouth wastewater system operates two plants. The smaller is at what was once the Pease Air Force Base, now home to businesses, the New Hampshire

“Sample now. Years later, you don’t want to have something show up that you didn’t sample for, just because it wasn’t yet required.”

BRIAN GOETZ

Air National Guard and two community colleges. Called the Tradeport, it employs more than 10,000 people.

The larger plant is on Peirce Island and was recently upgraded to 6.1 mgd, with biological air filtration and denitrification in a \$100 million project. Considerable money has been spent separating storm and sanitary sewers, and effort that has reduced combined sewer overflows significantly.

The drinking water system draws about 65% of its supply from a reservoir and dissolved air floatation facility designed by Hazen and Sawyer in Madbury; the rest comes from nine wells. Water for the Tradeport is treated in a plant on site.

The water system has about 8,500 residential customers and a number of large commercial and industrial users, including two electric power plants, two gypsum manufacturers and a large pharmaceutical company that now produces the Moderna COVID-19 vaccine. Residential consumption is only about 35% of demand.

DEALING WITH PFAS

In 2014, the city discovered that three of its wells were contaminated with PFAS and that one well exceeded the government’s health advisory for the compounds. That well was shut down. The likely source was fire fighting foam that had been used for years at the air base, not far from the water treatment plant.

As expected, the discovery created a media uproar. “We were on the forefront of the issue,” says Goetz. “We made the news on local and national TV networks.” While the Portsmouth utility was the first in its state with PFAS affecting wells, “we’re not alone now,” Goetz says.

Others can learn from the Portsmouth experience. The utility responded with what Goetz calls “aggressive forensics,” meaning the situation was thoroughly investigated and analyzed.

The effort involved a large team of people, including federal and state regulators, the U.S. Air Force’s civil engineering center, and various engineering consultants, who worked together to identify the fire retardants as the root cause of the contamination.

Then the team agreed upon a testing and treatment protocol that involved piloting granular activated carbon and ion exchange.

Brian Goetz Portsmouth, New Hampshire

TITLE:
Deputy director for public works

RESPONSIBILITIES:
Budgeting, staffing, planning for water, wastewater, stormwater systems

EDUCATION:
Bachelor’s degree, technology, Bowling Green State University; master’s, environmental policy, Indiana University

EXPERIENCE:
35 years management and consulting in the water sector in five states

AFFILIATIONS:
New Hampshire Water Works Association, New Hampshire Seacoast Drinking Water Commission, New England Water Works Association

AWARDS:
2021 Meritorious Achievement, NHWWA; 2017 Meritorious Achievement, NEWWA; 2015 Sustainability Award, New Hampshire Department of Environmental Services

GOALS:
Leave every system in better shape; attract and mentor next-generation professionals



From left, Mark Young, chief operator; Al Pratt, water resource manager; and Brian Goetz, deputy director of Public Works, adjusting the filter valve (Henry Pratt) operated by the AUMA actuator at the Portsmouth water treatment plant.



From left, Al Pratt, water resource manager; Brian Goetz, deputy director of Public Works; and Mark Young, chief operator.

“ We may have pipes that were originally in the middle of nowhere. Now they’re surrounded by buildings, roads, and other utilities.”

BRIAN GOETZ

A citizen advisory panel works on potential health effects of PFAS, including health studies and blood testing. The Air Force has reactivated its Restoration Advisory Board, which meets quarterly to review cleanup efforts at the former air base.

All test results are posted on the city’s website and are included in regular, updated water quality reports, also circulated publicly. Goetz prefers to communicate on the website as opposed to social media, which he considers to be more “of the moment.” However, the utility has developed an Instagram presence, @ThinkBluePortsmouthNH, which includes instructive videos about water quality and efficiency, and highlights the city’s storm-water program.

Goetz is proud that all data and information transmitted to the public comes from the utility itself: “We haven’t used any outside PR firm. We’ve done it all ourselves, and most every photo or written document is from us. It’s been a team effort. We are fortunate to have a great support staff willing to step up and do things beyond their day-to-day job descriptions.”

In the interim, beginning in 2016, two of the contaminated wells were treated with GAC.

Ultimately, a \$12 million GAC (Calgon Carbon) and ion exchange (ECT2) treatment facility was designed and constructed over two years and started up in April 2021. Over a four-week testing period, samples were collected weekly and analyzed for PFAS from each ion-exchange resin filter and from the GAC filters.

The well that had been shut down was reactivated later in 2021 after tests showed the new plant successfully removed PFAS. Today, using the EPA-approved Method 533, all the city’s water sources show PFAS levels well below the state maximum contaminant levels. Supply wells are sampled quarterly.

The Pease wells are sampled monthly, and sentry monitoring wells are tested quarterly to determine if any PFAS are moving toward the supply wells.

The PFAS treatment facility was designed in a partnership with Weston & Sampson, the city’s engineering consultant, through an agreement with the Air Force. Extensive piloting and analysis assured that the facility would treat for PFAS and be there in case other contaminants from the former air base should affect the wells.

So far, says Goetz, no other water-quality parameters appear to be affected by this change in the supply to Tradeport customers. The facility recently received an Engineering Excellence Award from the American Council of Engineering Companies of New Hampshire.

Goetz emphasizes that water utilities need to move quickly and not wait for the regulators: “Sample now. Years later, you don’t want to have something show up that you didn’t sample for, just because it wasn’t yet required.”

PUBLIC COMMUNICATION

The PFAS contamination and subsequent treatment plan required a major communication effort with the public and the news media. The utility developed practices that continue today across all water related-issues and have helped the utility win awards for public involvement and outreach from the New England Water Works Association.

Goetz has spoken “more times now than I can count,” to the news media, at conferences, and at public meetings about PFAS and the Pease solution. The city recently created a Safe Water Advisory Group co-chaired by Goetz to make sure citizens have input and access to information about the city’s water supply.

HANDLING THE MEDIA

That includes media relations. Goetz says the key is honesty, but it’s not always easy. For media inquiries, “If you’re on the phone, at your desk, you

PLAYING IN THE BAND

When Brian Goetz gets away from the office, he and his wife head to the New Hampshire mountains or the New England seacoast for camping, hiking or bicycling.

Or, he might pick up his guitar and get together with Tom Richter (banjo and vocals) and Dave Lemieux (mandolin, upright bass and vocals), members of the Sidewalk Boys folk and bluesy string band. They’ve been creating, recording and playing since their first CD in 2006.

“The Sidewalk Boys are half folk, half raggy blues and half crazy, adding up to more dirt than came out of the hole,” according to a Bandcamp review of one of their many albums.

“I met Tom through work with the city,” says Goetz. “I went in his office one day to see about some monitoring well locations. On his wall was this poster: ‘Tom Richter performing at the North Church.’ I told him I played music too, and eventually we got together and the music started to click. A couple years later we met Dave, and we’ve been a trio ever since.

“We’ve played shows throughout the area including the Press Room and the Book & Bar. It’s great fun.” Their music is available through Bandcamp (thesidewalkboys.bandcamp.com). You’ll find information and videos of the band on Facebook and YouTube.

(continued)

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can pull up information on your computer. Out in the field, it's more difficult." When questions from a reporter are emailed, he can better answer them and make sure he quotes the information correctly: "This is especially important when you are working in the parts per trillion."

Portsmouth also relies on press releases, which are effective although old school.

Information gaps present difficulties, Goetz notes. Early in the PFAS experience, utility representatives could only talk about what they knew.

"Not much was known or available about PFAS eight years ago," he says, and the sample methods were less advanced than today. Past sampling for PFAS might have registered nondetect, but samples now show detection due to improved laboratory methods. And sometimes utilities are at the mercy of regulations.

"The public may think that suddenly we're out of compliance on some parameter, when what's actually happened is that authorities have lowered the standards. The amount of contaminant hasn't changed, just the acceptable level."

WATER EFFICIENCY

The Portsmouth water utility engages with the public in other ways. Customers like its Water Efficiency conservation effort. "We're really proud of what we're doing, and we get good feedback from our customers," Goetz says.

"A gallon of water saved is a gallon that the city doesn't have to find, produce, treat and test," says the utility's website. It also doesn't require maintenance. The program, in place for over 10 years, has included water conservation kits, rain barrels, leak detection, automatic meter reading, the U.S. EPA WaterSense program, and water efficiency rebates. Tiered water rates charge large volume users more than those who use less.

The program has delivered results: Residential water usage has dropped 21% since the program started. "We're the first and still the only water system in New Hampshire doing this," Goetz says. "There's no better way to be conservative than to preserve our water and natural resources. Why use six gallons to flush a toilet when you could use only 1.6 gallons?"

A LOOK AHEAD

In reflecting on his career, Goetz can look upon 35 years of management and consulting experience in New Hampshire, Maine, Massachusetts, Utah and Indiana. His recent work has encompassed long-range planning, water demand analysis, supply and source management, financial capacity and regulatory compliance issues.

He is a past president of the New Hampshire Water Works Association, a member of the state's Seacoast Drinking Water Commission and the state's Drought Management Team, and a member of the New England Water Works Association Water Resources Committee.

As much success as Goetz and Portsmouth have had, he has concerns about the future of water and wastewater management and is not shy about voicing them. "The industry is getting increasingly complex," he says. "It's not one size fits all and it certainly isn't what it was when I started 35 years ago."

Maintaining infrastructure can be expensive: 72% of the utility budget goes to capital investment and operating expenses, while 28% goes to personnel. "Everything we do now has to be better than what we're replacing," says Goetz. "We may have pipes that were originally in the middle of nowhere. Now they're surrounded by buildings, roads and other utilities." Replacing them is costly.

As illustrated by the PFAS issues, regulatory requirements are tightening and will continue to do so, Goetz believes. Additional testing adds cost.



Brian Goetz and his team take pride in communicating effectively with customers and the general public. (Turbidimeter from SWAN Analytical.)

“There’s no better way to be conservative than to preserve our water and natural resources.”

BRIAN GOETZ

After decades of indifference, the public is paying more attention to water and wastewater utilities.

Finding qualified operators able to deal with such complexity is not easy. The work also requires constant attention: "If you have an emergency on a Friday night you can't wait until Monday to fix it."

Having faced down many of these challenges, Goetz is proud of years in the profession and the strides his utility has made, but he warns, "I don't see the situation changing in the future." tpo

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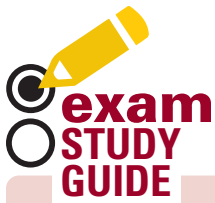
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WASTEWATER

By Rick Lallish

What is the main cause of rising sludge in an activated sludge secondary clarifier?

- A. Toxic shock load
- B. Denitrification
- C. Nitrification
- D. High F/M level

ANSWER: B. Rising sludge is common in secondary clarifiers and normally is caused by denitrification due to excessive detention time. When the sludge is allowed to settle and has used all the available oxygen, the sludge will begin to denitrify and release the nitrogen gas. Small particles of sludge will then be carried to the surface. This should not be confused with sludge bulking. Some measures to control the amount of rising sludge are increasing return rates, increasing the F/M ratio or decreasing sludge age. A quick and easy way to check rising sludge is to use a settleometer. Good sludge should remain settled for at least an hour before rising to the surface. More information may be found in the OWP, CSU-Sacramento textbook: *Operation of Wastewater Treatment Plants*, Seventh Edition, Volume 2, Chapter 11.

DRINKING WATER

By Drew Hoelscher

At what temperature will an aqueous solution of 50% sodium hydroxide (by weight) freeze?

- A. -12 degrees F
- B. 0 degrees F
- C. 32 degrees F
- D. 58 degrees F

ANSWER: D. Aqueous sodium hydroxide is a common chemical used in water treatment. Also called caustic soda, sodium hydroxide is an extremely basic solution, so safety training is pertinent before handling. In addition to the safety concerns, proper feeding applications should be considered. Aqueous sodium hydroxide at 50% by weight will freeze at around 58 degrees F. This means the chemical storeroom and chemical feed point temperatures should be monitored. For example, sections of a chemical feed line can become clogged if the line is exposed to colder temperatures than the storage room. However, diluting to a 25% solution can eliminate freezing in most cases. Aqueous sodium hydroxide at 25% by weight will freeze at around 0 degrees F.

ABOUT THE AUTHOR

Rick Lallish is water pollution control program director and Drew Hoelscher is program director of drinking water operations at the Environmental Resources Training Center of Southern Illinois University Edwardsville. tpo



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Full of Purple Pipes

AN OKLAHOMA CLEAN-WATER PLANT CUTS POTABLE WATER USE DRAMATICALLY WITH REUSE PROJECT. OTHER IMPROVEMENTS INCLUDE IN-PIPE UV DISINFECTION AND A BIOFILTER FOR ODOR CONTROL.

By Steve Lund

Using recycled effluent instead of potable water for in-plant processes saves thousands of dollars every month at a wastewater treatment plant in Broken Arrow, Oklahoma.

Not long ago, the Lynn Lane Wastewater Treatment Plant was the city's largest water consumer. Potable water was used for all the water-reclamation processes as well as cleaning at the plant (5-6 mgd average flow).

"We were pulling in 100,000 to over 200,000 gpd of drinking water to run all of our processes," says David Handy, facility manager. "That includes our washdown areas, water we use in the headworks for screening and grit removal, and chlorine disinfection."

MEANINGFUL SAVINGS

The reuse system takes effluent just before discharge to a tributary of the Arkansas River and puts it into a wet well that pumps it throughout the plant in purple pipes. The potable waterline was severed ahead of the headworks, so the potable water goes only to the administration building and eyewash stations in the plant.

The project was executed as a part of a \$3 million clarifier rehabilitation project. Handy estimates that the plumbing and pumps to use treated effluent as process and washdown water represented about one third of the cost. He considers that a good financial investment.

"We went online in October, 2020," Handy says. "For 2021 our saving was \$55,000. We seem to be saving about \$6,000 a month." The reuse project also preserves water and the resources required to treat it, although Broken Arrow does not usually face water shortages.

Before installation of purple pipes throughout the plant, the only reuse water at the plant was for irrigation at two nearby golf courses, which pump water directly from the chlorine contact chamber to their holding pond.

DISINFECTION CHANGE

The savings from the reuse project will be tempered somewhat by another project coming online this year: conversion from chlorine disinfection to in-pipe UV (Wedeco). The new system will require less process water than the chlorine system, which uses chlorine gas and sodium hypochlorite.

One reason for the switch is the potential hazard of storing and handling chlorine gas. A residential development is fairly close to the treatment plant. "My risk management plan is about 16 binders," Handy says. "I would dearly love to reduce that to two or three."

Even with UV disinfection, chlorine handling will not be eliminated: The plant will still chlorinate the water sent to the golf courses. "We'll still have sodium hypochlorite, strictly for the reuse season, May through September," Handy says. "We are required to have chlorine disinfection for the golf courses."



ABOVE: Inside the pump station that handles effluent for reuse. The plumbing is painted in the signature purple for recycled water.

RIGHT: Hydrants around the wastewater treatment plant in Broken Arrow, Oklahoma, are painted purple to indicate reuse water.



REDUCING ODOR

Being close to homes played a role in another recent project — redesigning the headworks. Odor problems at the plant were the subject of a study in 2002 indicating that the main sources were two open screw pumps and an aerated grit chamber. A new system went online in 2019.

"We eliminated those open screw pumps that were just splashing water and breaking down all the organics," Handy says. "We removed them, those two structures and an aerated grit chamber as well. We demolished them and built one brand new headworks facility. We scrub the air inside the headworks and run it through a biofilter designed by HDR with composite media."

The new headworks has a perforated plate screen with 6 mm holes (SAVECO / Enviro-Care). From there the influent goes into a pair of wet wells with 24-inch and 14-inch submersible pumps (KSB) that move the water into the grit removal system (Hydro International). From there the wastewater travels to a splitter box where the influent is mixed with return activated sludge and into two oxidation ditches.

UNUSUAL FREEZE-UP

The new system has worked well. Air is vacuumed from the building structure, moistened through a misting waterline, and then blown into the biofilter media through a header system.



A new pump station houses pumps for reuse and cleanup water at the Lynn Lane Wastewater Treatment Plant.

“For 2021 our saving was \$55,000. We seem to be saving about \$6,000 a month.”

DAVID HANDY

“We’ve had no complaints except for one in February 2021, when we had a hard freeze,” says Handy. “The misting line froze. We had heat tapes on it, and they were working, but it wasn’t enough.”

That was unusual weather for the Southwest — it snowed as far south as Houston — and as unlikely as it is to be repeated, the plant staff has developed a plan to cope with it. “We just adapted new procedures,” Handy says. “If it gets that low again, we’ll shut down and drain the misting line and go to a manual mode where we’ll hand-water the bed every day or two.”

After the misting line froze and burst. It was replaced with a more durable HDPE pipe in place of PVC. That one pipe failure underscores how effective the system is when everything is working.

“The biofilter has been doing its job,” Handy says. “That’s the first thing everybody notices when they come into the plant: There’s no smell. Our operators do a fantastic job of keeping this plant up to date and doing all the things in the daily operations to keep it efficient.” tpo

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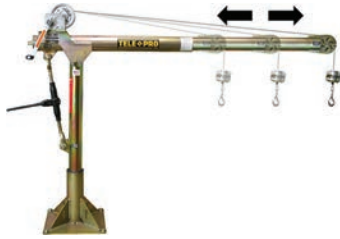
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product spotlight wastewater

Trash pump line gets upgraded solids-reduction technology

By Craig Mandli

Today's wastewater contains objects such as trash bags, wipes, mop heads, hair, industrial byproducts and agricultural wastes that can do a number on pumps that aren't equipped for them. To combat them, **Gorman-Rupp** is offering **Eradicator Plus solids reduction technology** for 3-, 4- and 6-inch Super T Series self-priming centrifugal trash pumps. The Eradicator Plus product was specially designed for the most extreme-duty applications in the municipal, industrial and agricultural markets.

"It is specifically designed for installations where nuisance clogging is affecting uptime and maintenance costs," says Jeff Hannan, product manager – centrifugal pumps for Gorman-Rupp. "For those extreme-duty applications where municipal waste, wipes, industrial byproducts, agricultural wastes, and other organic solids are present, Eradicator Plus cuts and tears the solids, allowing them to pass through the pump."

Eradicator Plus is ideal when cutting and tearing of organic solids entering the pump is required. Based on the same principles of Gorman-Rupp's Eradicator Solids Management System, Eradicator Plus models are the most aggressive in the Super T Series product lineup. The technology features an easily removable lightweight inspection cover, a back cover plate incorporating an obstruction free flow path, a heavy-duty hard iron continuous vane impeller with a thick back shroud to prevent debris buildup, an extra-thick hard iron wearplate with notches, grooves and oversized lacerating tooth to cut and shred organic solids, and an upgraded stainless steel, load-bearing shaft.

Eradicator Plus solids
reduction technology
from Gorman-Rupp



"The Eradicator Plus went through countless hours of lab testing on a variety of debris including nonflushable wipes, pieces of rope, trash bags, mop head chunks, plastic bottles, rubber gloves and rags," says Hannan. "It was field tested on raw sewage applications in the municipal market, the portable restroom industry, and animal waste at multiple sites including poultry and livestock processing. It provides an economical option for not only providing solids handling solutions, but the added benefit of solids reduction."

For Super T Series pump installations, complete units are available in cast iron construction. In addition, Eradicator Plus upgrade kits are available for Super T Series pumps currently installed in the field. Based on existing product model number, kits will include all components needed to make an easy onsite conversion.

"Feedback from the field has been outstanding, whether customers are installing brand new pumps or simply upgrading existing Super T Series pumps," says Hannan. 419-755-1011; www.grpumps.com

contacting conductivity sensors. The body is made of chemically resistant polyether ether ketone for use in aggressive chemical solutions and temperatures up to 266 degrees F and pressure up to 295 psig. A built-in 1000 ohm Pt RTD provides output for automatic temperature compensation ensuring accuracy even when sample condition varies. All Sensorex TCSP probes are supplied with a nine-conductor cable with tinned ends for easy connection to controller, transmitters and other devices. Available standard with 10 foot or 20 foot cables; custom lengths available on request. 714-895-4344; www.sensorex.com



QED AP4 Ultra auto pump system

QED Environmental Systems' AP4 Ultra high-temperature auto pump system is designed for landfill and groundwater remediation pumping. With the ability to withstand liquid temperatures of up to 250 degrees F, the pump delivers durable and low-maintenance pumping performance in landfill leachate, condensation risers and groundwater wells. The AP4 Ultra

features proprietary non-stick finishes to reduce the potential for solids buildup. Parts for the QED Ultra are made from 316 grade stainless steel and engineered polymers which make the pump highly resistant to harsh leachates, free-phase and dissolved fuels, BTEX and MTBE. Its design helps create an extended pump life that reduces the need for regular replacement. The high-temperature pump tubing sets carry the same UV protection as QED's tubing, providing chemical resistance to most compounds and corrosive fluids. 734-995-2547; www.qedenv.com



Thermo-Tech auger heating system

Thermo-Tech's custom designed auger heating system prevents freezing issues associated with sludge augers exposed to outside subfreezing temperatures. The weathertight systems are fabricated from grade 304 stainless steel and feature 120-, 240- or 480-volt input. Options include a washdown design and an adjustable temperature output. The system not only eliminates freezing, but it is also able to dry the sludge, preventing it from freezing as it exits the auger into the discharge pipe. The system is cost-effective, saving on labor expenses and eliminating makeshift solutions or expensive enclosures that are commonly used to deal with auger freezing issues.

304-788-1400;

www.thermotechinc.com



Val-Matic Ener-G ball valves

Val-Matic's Ener-G ball valve offers equal percentage flow characteristics, rugged AWWA construction and negligible headloss. When fully open, the Ener-G provides 100% flow area equal to the pipe size and contributes to savings in pumping costs. The valve's design and performance have been verified through proof of design and independent flow testing. The valve is available with cylinder, electric motor or manual actuation.

630-941-7600;

www.valmatic.com tpo

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product spotlight water

Pump offers high-volume chemical feed

By Craig Mandli

The chemical feed pumps a municipality uses to treat its potable water need to not only be accurate and durable, they also are often required to handle high volumes. The **FLEXFLO M5 Peristaltic Metering Pump** from **Blue-White Industries** hits the mark, as it's capable of delivering outputs up to 9 gpm at only a 75 RPM motor speed, maximizing tube life and reducing overall maintenance. The higher output answers a huge industry need in the municipal market, according to Patrick Murphy, director of engineering with Blue-White Industries.

"Pumps this size in the industry typically need an external controller to control the motor," says Murphy. "Instead, ours has all the controls built into the pump."

The all-inclusive M5 includes a roller assembly that reduces pulsations by 80%, and the pump tube assemblies along with dual channel tubing deliver excellent tube life. Casters placed on the back of the pump, as well as handles situated on the pump head cover assist in moving the large pump and help with making the installation process easy. A chemical-resistant enclosure houses an energy-efficient BLDC motor, premium control boards and all connections. It features a large 5-inch display for easy viewing with simple and intuitive touchscreen controls and icon-driven menu navigation. Remote control signal options include Pulse, 4-20mA, Modbus TCP, EtherNet/IP, and PROFIBUS for enhanced

FLEXFLO M5 Peristaltic Metering Pump from Blue-White Industries



supervision and automation for critical metering and transfer applications. "The energy-efficient BLDC motor is an improvement over AC motors that lose most of their efficiency through heat," says Murphy.

For applications where chemical demand is high, such as some municipal water treatment applications, the FLEXFLO M5 is the answer, according to Murphy.

"We would always hear from customers that wanted to use our products but couldn't because we couldn't get to the flow rate required for their application," he says. "That is what led to the initial development of the pump. It's a good fit to the industry because it meets a higher chemical feed application while also being feature rich in controls."

Accordingly, the increase in capacity has got the industry talking. "We haven't started beta testing, but people at tradeshow didn't think it was real at first," says Murphy. "They were taken aback at its size and features. We have had customers already put in reservations in excitement from just seeing the product."

714-893-8529; www.blue-white.com

Treatment, Filtration and Stormwater

By Craig Mandli

Aerobic Treatment

PRODEX BAE

BAE (Biological Activity Enhancer) from Prodex is an organic liquid formula for use in aerobic and anaerobic environments to improve operational efficiency and maximize renewable energy production. As the green component to the engineered infrastructure, it provides plants with a low-cost biostimulant for existing microbes, increasing activity and populations to give the plant the best biology possible. Wastewater treatment plants can use it to boost biogas production, convert food waste to energy, help remove nitrogen, in maintenance dosage/emergency use, to reduce operational costs such as hauling, chemicals and energy, enhance plant operational efficiency and stability, improve solids handling and sludge settling, and accelerate recovery after plant upsets. By maximizing the microbial workforce, it helps the industry work toward cleaner water resources and a greener energy supply. **856-234-4540; www.prodexproducts.com**



BAE (Biological Activity Enhancer) from Prodex

Blowers



ZZ Series blowers from Eurus Blower

EURUS BLOWER ZZ SERIES

ZZ Series blowers from Eurus Blower are drop-in replacements for competitor blowers. They have heavy-duty cast housings, machined impellers, alloy steel shafts with oversized bearings, hardened/precision machined steel forged gears, oil-lubricated gear and/or grease- or oil-lubricated drive sides, plus keyless locking assemblies for easier timing gear

maintenance. The blowers provide up to 15 psig pressure and 2,350 cfm flow. **918-361-0285; www.eurusblower.com**

Filtration Systems

EVOQUA WATER TECHNOLOGIES FORTY-X DISC FILTER ARMOR SERIES

The Forty-X Disc Filter Armor Series from Evoqua Water Technologies is a high-rate filtration device that utilizes an integrated pre-screen and stainless steel panels that are designed to accommodate high solids loading capacities and greater hydraulic throughput. The woven optimum primary mesh filter panel utilizes 316L stainless steel threads to create a weave that improves solids collection and rejection, which makes this disc filter suitable for stormflow applications. The panel



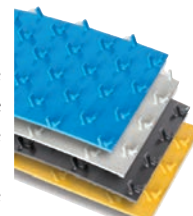
Forty-X Disc Filter Armor Series from Evoqua Water Technologies

configuration includes a molded structural frame and pressured assisted seal, allowing the panels to sustain and operate at a higher headloss and provide higher throughput when compared to other disc filter synthetic media. The series combines the technology of outside-in and inside-out filtration into a single PLC-controlled unit with influent water flowing through the prescreen (outside-in) into the disc filter panels (inside-out). This combination of two filtration technologies provides an effective option for challenging applications. **844-409-9492; www.evoqua.com**

Lagoon Products

AGRU AMERICA SURE-GRIP

Sure-Grip liners from AGRU America are made of HDPE, HDPE-el, PP, PVDF or ECTFE, and serve as a long-term alternative to spray-applied concrete protection products. The liners prevent concrete corrosion and degradation, can substantially extend the lifetime of a structure, and by preventing exfiltration and infiltration, they can provide direct protection for the environment. The liners have anchoring systems that enable construction in areas of significant backpressure. Unlike spray-applied liners, which have to be reapplied regularly due to cracking or delamination, these liners are long-lasting, and are designed to avoid the residuals cost often associated with concrete spray-on liners, which require tank emptying and cleaning every few years for reapplication. **843-546-0600; www.agruamerica.com**



Sure-Grip liners from AGRU America

BYO-GON PX-109

Byo-Gon PX-109 is a nontoxic, noncorrosive and 100% organic and biodegradable alkaloid compound used for eliminating grease, sewage odor and hydrogen sulfide from restaurant grease traps, lagoons and municipal sewage systems. As a stimulant to enzymatic activity at the cellular level, it promotes more rapid cell growth and consumption of organic material, overcoming limiting



Byo-Gon PX-109 compound

environmental factors to stabilize wastewater systems. Its use promotes healthy biological systems, preventing the need for large capital expenditures, as well as reducing costs. It is organically certified by OMRI. **888-296-4661; www.byogon.com**

GLASDON GUARDIAN LIFE RING CABINETS

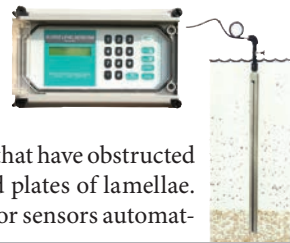
Guardian Life Ring Cabinets from Glasdon are designed to keep lifesaving devices safe and ready for action in the event of an emergency. The strong, durable and corrosion-resistant cabinets offer high visibility all-year-round. They are available in two sizes for USCG-approved life rings, and are available with or without life rings. A toggle latch secures the lid, while allowing easy access in an emergency. Built-in security features help to deter theft and vandalism, while the Ropemaster System aids quick and easy deployment of the ring buoy and rope in an emergency. They can be pole-, wall- or rail-mounted. They include essential decals inside the cabinet to assist with quick deployment of the life ring and throwing rope. The exterior front can be personalized with extra decals with instructions or warnings along with company or authority branding. **855-874-5273; www.glasdon.com**



Guardian Life Ring Cabinets from Glasdon

MARKLAND SPECIALTY ENGINEERING AUTOMATIC SLUDGE BLANKET LEVEL DETECTOR

The Automatic Sludge Blanket Level Detector from Markland Specialty Engineering uses high-intensity infrared light that, along with its slim profile, enables it to measure the sludge bed depth even in water and wastewater clarifiers and tanks that have obstructed or constricted areas, such as the inclined plates of lamellae. Beam intensity of the LED-phototransistor sensors automatically adjusts for thick or thin biosolids concentration or even light flocs. This detector allows operators to program desludge pumps to run only when necessary for maintaining the preferred liquid-solids interface level, saving wear and tear on pumps. It helps maximize water removal and optimize sludge feed density. In DAF units, it can adjust surface skimmer speeds to match variations in the thickness of the floating sludge layer. In SBRs, it can control the decant valve to minimize cycle times. Calibration is not required. 855-873-7791; www.sludgecontrols.com



Automatic Sludge Blanket Level Detector from Markland Specialty Engineering



MBBRs

FEDERAL SCREEN PRODUCTS MBBR SCREENS

MBBR Screens from Federal Screen Products

Federal Screen Products custom fabricates MBBR Screens that maximize flow rates while containing biofilm carriers, helping save on maintenance costs. They are fabricated with wedge wire by resistance welding V-shaped wire on shaped support rods. These thousands of fused points create a honeycomb-like structure that provides a strong and accurate continuous slot. This results in a product that provides accurate flow, distribution and effective media and debris filtration and retention. Wastewater screens are available in a wide range of profile wires to suit most systems, and can be designed in flat, curved or cylindrical form to meet customers' drawings and specifications. Robust for vertical wall applications, screens are also self-cleaning when designed to the flow rate and are passivated in-house, which allows for a quality of finish, extending product life. 905-677-4171; www.federalscreen.com

MBRs

SMITH & LOVELESS TITAN MBR

The TITAN MBR packaged membrane bioreactor system from Smith & Loveless includes high-performance flat sheet membranes, easy component access, intuitive graphical touch-screen PLC controls, smart advanced data monitoring and communications, reduced process complexity and a streamlined membrane clean-in-place process. It is designed with a stable process tailored to permit requirements and capable of achieving high effluent quality and Title 22 approved water reuse. It has stainless steel componentry and streamlined electrical layout with an operator-friendly wire management system. The treat-



TITAN MBR membrane bioreactor system from Smith & Loveless



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ment plant will arrive in a complete and compact factory-built system with significantly less field assembly for even swifter installation and startup. 800-898-9122; www.smithandloveless.com

SUEZ WATER TECHNOLOGIES MOBILE MEMBRANE BIOREACTOR

The mobile membrane bioreactor from SUEZ Water Technologies is a fully integrated wastewater treatment system incorporating biological processes and ZeeWeed 500 ultrafiltration membranes in a compact, ready-to-operate unit designed for direct reuse or discharge applications that require high-quality effluent. The unit is a self-contained system with modular connections for the process unit and bioreactor. It has an integrated drum screen and aeration diffusers and is digitally enabled with the company's InSight asset performance management platform. The ultrafiltration membranes have a reinforced membrane fiber structure for durability. It is well suited for applications with variable influent quality and high levels of suspended solids. 866-439-2837; www.suezwatertechnologies.com



Mobile membrane bioreactor from SUEZ Water Technologies

Media Filters

AQUA-AEROBIC SYSTEMS AQUASTORM

The AquaStorm cloth media filtration system from Aqua-Aerobic Systems is an effective solution for wet-weather applications, including



AquaStorm filtration system from Aqua-Aerobic Systems

combined sewer overflow, sanitary sewer overflow and stormwater. The system uses a disc configuration and OptiFiber PF-14 pile cloth media, and it operates with three zones of solids removal to filter wet-weather flows without the use of chemicals. It is designed to handle a wide range of flows in a fraction of the space and offers simple startup/shut-

down with unattended operation for remote locations. The system also allows for dual-use application for tertiary and wet-weather operation. **800-940-5008; www.aqua-aerobic.com**

Mixers

JDV EQUIPMENT NOZZLE MIX SYSTEM

The Nozzle Mix System from JDV Equipment is a dual-zone mixing technology that provides uniform mixing patterns that produce even distribution and a stable environment. It can help optimize solids suspension and contact to promote efficiency in a wide range of applications. The system is designed with pumps installed outside the tanks to facilitate ease of maintenance. The pumps are typically chopper pumps or pumps incorporating in-line grinders that prevent fibrous materials from accumulating and causing plugging problems. The application dictates which type(s) of the many varied pump options can be used. The high-velocity nozzles are mounted inside the tank and are oriented to discharge in a flow pattern that completely mixes the tank contents. **973-366-6556; www.jdvequipment.com**



Nozzle Mix System from JDV Equipment



VortaFlo static mixer from Park Process

PARK PROCESS VORTAFLO

The VortaFlo static mixer from Park Process combines two mixing nozzles of different sizes to create turbulence and induce mixing. The addition of the injection quill allows chemicals or polymer to be injected in the mixing zone past the turbulence-creating nozzle prior to passing

through the mixing nozzle. In the case of polymer flocculating biosolids, the turbulence nozzle causes the biosolids to roll in the mixing chamber so the polymer has maximum contact with biosolids particles prior to passing through the mixing nozzle, where flocculation is promoted. It is available in sizes ranging from a 1-inch inlet/outlet and 2-inch mixing chamber to a 12-inch inlet/outlet and 20-inch mixing chamber. **855-511-7275; www.parkprocess.com**

Nutrient Removal

AQUA-ZYME DISPOSAL SYSTEMS ADS

The ADS 30-yard open-top roll-off dewatering unit from AQUA-Zyme Disposal Systems can be filled with 22,000 to 25,000 gallons of biosolids at 1% to 2% solids in



ADS dewatering unit from AQUA-Zyme Disposal Systems

about two hours. After draining for 24 hours, the unit can be picked up using a standard-capacity roll-off truck and transported for solids disposal. Sludge volume can be reduced by 80% with reductions to 98% in BOD, COD, FOG and TSS. Effluent is clear, the unit has few moving parts and the size of filter media can be selected according to job requirements. Standard equipment includes a roll-over tarp system; side, floor and center screens; 1/4-inch floor plate; 7-gauge side plates; four door-binder ratchets; eight drain ports; two inlet ports; and a long-handle scraper. Units are also available in a 15-yard size. **979-245-5656; www.aqua-zyme.com**

FLOTTWEG SEPARATION TECHNOLOGY XELLETOR

Xellektor series separators from Flottweg Separation Technology include a rotor and scroll designed to reduce the consumption of polymer while also reducing energy consumption. Depending on biosolids quality, the centrifuge can save about 20% on energy while providing significantly better performance. It can increase throughput by up to 15%, reduce the volume of biosolids by as much as 10% and save up to 20% in energy and polymer consumption. **859-448-2331; www.flottweg.com**



Xellektor series separators from Flottweg Separation Technology

Oxidation

BIOSAFE SYSTEMS OXYFUSION

The OxyFusion system from BioSafe Systems generates peroxyacetic acid on site to meet the disinfection needs of municipal wastewater treatment facilities. This technology is praised for precisely dosing powerful oxidizing chemistry that eliminates pathogens on contact and leaves no harmful and or regulated residuals. The use of concentrated precursor chemistry significantly reduces shipments, providing an economic answer to sustainable disinfection. It comes preassembled and includes a PLC system to make measuring, monitoring and datalogging easy, with reports available via mobile app or offsite browser. **860-290-8890; www.biosafesystems.com**



OxyFusion system from BioSafe Systems

DE NORA WATER TECHNOLOGIES TETRA ABF

The TETRA ABF bioactive filter from De Nora Water Technologies combines the strong oxidation power of ozone with a biologically active filter to effectively remove micropollutants while reducing the formation of disinfection byproducts in drinking water and water reuse applications. Using a lower dose of ozone, it partially oxidizes carbon into smaller biodegradable organic compounds for removal in the downstream bioactive filter. By reducing ozone doses and using lower-capacity ozone equipment versus conventional ozone-only treatment, treatment plants may reduce capital costs and energy consumption. The advanced process does not require upstream RO or UF membranes commonly used with other types of direct and indirect water reuse schemes. **215-997-4000; www.denora.com tpo**



TETRA ABF bioactive filter from De Nora Water Technologies

Asahi/America introduces new field service technician

Asahi/America announced the addition of Brad Doughty to its technical field service team for all U.S. He will help train customers on using Asahi/America's welding equipment to properly install the company's single and double wall piping systems.



Brad Doughty

New watts.com content spotlights training

The training section of watts.com has been updated with all new content and features. It provides an overview of all Watts' training, which includes instructor-led training offered at six Watts Learning Centers in the U.S. or through Lunch & Learns at customer sites. Trainers are experts in plumbing and flow control, drainage, water quality or HVAC and hot water, and customers can now request training through an online form. Quick online learning is available 24/7 at Watts Works Online. The platform hosts hundreds of self-paced eLearning modules. Continuing education courses, approved by ASPE and the AIA, enable engineers, architects and others to stay up to date on industry trends and advance their careers.

Duperon awarded ISO 9001:2015 certification

Duperon was awarded ISO Certification for its systems and processes under ISO 9001:2015. This marked the company's first ISO audit, which it completed with zero findings. The ISO 9001:2015 certification sets the standard for a quality management system, which is achieved when an organization exhibits its ability to consistently provide products and services that meet customer and regulatory requirements.

Centrisys/CNP expands team

Centrisys/CNP has hired two new team members. Jeffrey Kin joined the company as applications and project management director, and Steve Corless came on board as electrical engineering director. In his new role, Kin leads a team managing bid quotes and the execution of contracts on new equipment purchases. Corless oversees Centrisys/CNP's electrical department and is an integral part of the continuous advancement of equipment and service.



Jeffrey Kin



Steve Corless

BlueTriton Brands joins The Water Council's WAVE program

The Water Council announced BlueTriton Brands has signed onto The Water Council's WAVE program, becoming the first company in the beverage industry to participate. BlueTriton is a North American provider of bottled water brands including Poland Spring, Ice Mountain and Pure Life. WAVE will help BlueTriton improve its enterprise-level water stewardship performance and public reporting, concluding with independent verification of its progress.

Ecoremedy adds to management team

Ecoremedy, which designs complete biosolid drying and gasification facilities for wastewater treatment and other organic wastes, announced three new hires. Aaron Lewer serves as project engineer and brings more than 15 years' experience designing, analyzing, testing and commissioning complex industrial systems in the food processing and laboratory automation industries. New Director of Business Development, Sales and Marketing Dion Banks has more than two decades of international business experience. And new field operations manager Brad Morgan brings more than 28 years' experience as an engineering and maintenance management professional. **tpo**



Aaron Lewer



Dion Banks



Brad Morgan

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UV disinfection system assists building in achieving green project award

Problem

Architects of the skyscraper at One Bryant Park in New York City sought to create a green structure that would conserve energy and resources, including water.

Solution

A graywater system with holding tanks on certain floors captured rainwater and stored it along with graywater. After filtration, **MEGATRON germicidal UV disinfection systems** from **Atlantic Ultraviolet** inactivate harmful organisms. Multiple setups installed every nine floors handle the building's water flow.



RESULT:

Water recycling help save millions of gallons of drinking water and reduce water consumption by almost 50%. The rainwater and recycled graywater are used for restrooms and irrigation. **631-273-0500; www.atlanticultraviolet.com**

Plant reduces operating costs with online process analyzers

Problem

At the Howard F. Curren Advanced Wastewater Treatment Plant in Tampa, Florida, influent volume and characteristics vary constantly, making reliable real-time information about nitrification and denitrification critical for process control.

Solution

Plant management invested in three **online analyzers** from **ChemScan, an In-Situ Company**. The analyzers provide automated sampling and real-time results. At two points on the six stages in the plant's nitrification reactors, the analyzers automatically draw samples and analyze them for nitrate and ammonia. Connecting the analyzers to a PLC via the SCADA enables automatic adjustment of blowers for more precise control. The analyzers also help control denitrification. Samples from the nitrification final tanks analyzed for nitrates. The resulting value is used to regulate the pace of the methanol feed for denitrification.



RESULT:

"Online monitoring has removed the guesswork from optimizing our nitrification and denitrification processes," says Robert Decker, operations specialist. "With access to accurate and timely information we've improved our operations and reduced costs." More efficient use of methanol also saves money, and on-site reagent mixing and saves time. The process eliminates hourly tests for ammonia, nitrate, nitrite and chlorine residual and manual chemical feed adjustment. **800-665-7133; www.chemscan.com**

Dairy producer complies with demanding standards

Problem

A dairy processing company in Colombia needed to improve water treatment in production and equipment washing to meet government standards. Process flows reached 6,600 gph with a high content of TSS, FOG, COD and BOD. The flow needed to increase to 9,250 gph. The company had limited space and a primary DAF system that could not clean the water to the regulatory standard of 7 mg/L BOD.

Solution

Clean Water Technology designed a complete system including an advanced primary treatment followed by biological treatment and sludge treatment. The system consists of a **GEM System150/300 EGSB anaerobic reactor**, which removes 75% of the COD, converting it into biogas, and a membrane bioreactor. The primary and secondary sludges go to an advanced **Swingmill dewatering system**.



RESULT:

The system helped the company outperform regulatory standards, while taking up less space. It also reduced operating costs. **310-380-4648; www.cwt-global.com**

Self-Cleaning screening system prove reliable in harshest storm conditions

Problem

Though Texas is drought-prone, the risk of extreme rainfall and flooding is projected to increase by 30-50% by 2031, requiring improved stormwater infrastructure. Before installation of self-cleaning Trashracks (Duperon), the city of Dallas Hampton Road Pump Station operated without any protection in front of its stormwater intake grating. While the site can handle up to 201 mgd, the pumps continuously clogged. Operators had to use hand rakes to clear the grates, more than 100 feet long,

Solution

The Trashrack automated screening system is designed to manage highly variable debris, large and slam, and ever-changing high-velocity stormwater flows. Its continuously and automatically cleaned screen assures maximum efficiency.



RESULT:

The city furnished the pump station with five units installed over five years. "We have debris that varies from grass to very large tree trunks, and we wanted equipment that could handle all of that," says Dhruv Pandya, district manager for the city Department of Flood Control. "The systems performed efficiently and effectively." **800-383-8479; www.duperon.com**

Town solves challenges with advanced wastewater treatment system

Problem

Section, Alabama, needed an expandable, low-maintenance wastewater treatment system to replace nonfunctioning septic systems serving 700 residents and commercial entities.

Solution

To treat 30,000 gpd, system designers chose an **ECOPOD advanced wastewater treatment system** from **Delta Treatment Systems**. It treats domestic waste at up to 300 mg/L BOD and TSS quietly and efficiently with no odor and no inner tank filters, screens, or diffusers to service. It handles daily flow fluctuations of 50-100%.



The units were shipped to the site ready for installation. A 14,200-gallon flow equalization tank with duplex pumps was installed ahead of the treatment reactor tanks. A 19,190-gallon primary tank precedes the flow equalization tank. After three years, an ECOPOD with 15,000 gpd of capacity was added to accommodate population growth. Effluent is released via drip dispersal.

RESULT:

The system is operating as designed and requires only minimal operation and periodic professional maintenance. **800-221-4436; www.infiltratorwater.com**

Plant upgrades aging equipment and increases capacity

Problem

The Robert B. Diemer Water Treatment Plant in Yorba Linda, serving multiple communities in the area of Orange County, California, needed more capacity. Updating aging equipment while using existing infrastructure was key. The flocculator in particular needed upgrades and quick access to critical drive components to prevent downtime while enhancing safety.

Solution

The Metropolitan Water District of Southern California chose **Jim Myers & Sons Mega-FLOCS paddle wheel flocculators** to meet the various challenges. A dry well gives plant staff instant access to critical drive components. A through-wall drive design propels 12 full-size paddle wheels per stage. JMS also provided a complete drive chain cover, enhancing safety. All system components including bearings, shafts, drives and paddles were specified and manufactured to rigorous standards.



RESULT:

Two phases of the project have been implemented and are producing water to the required 520 mgd capacity. The equipment is performing well. **704-554-8397; www.jmsequipment.com**

City benefits from packaged treatment system to rejuvenate aging plant

Problem

The city of Savage, Minnesota had relied on legacy Tonka Water (now Kurita America) equipment at their No. 2 Water Treatment Plant since 1985. When it came time to replace the aging infrastructure, they wanted to keep aeration and gravity filtration, but also enhance the treatment process with detention.

Solution

Kurita America's Dualator III packaged treatment product consolidates aeration, detention and filtration into a single low-profile unit. The system includes two separate 1,500 gpm, 48-by-13-by-14-foot-high units that each incorporate aeration, detention and filtration functions within a single vessel. The aerator section provides natural iron oxidation, after which chemicals are added through a static mixer for additional oxidation and radium adsorption. The baffled detention chamber and available volume above the filter media provide approximately 25 minutes of total reaction time for particle formation prior to removal through GreensandPlus and anthracite dual media. Large hinged manways allow for ease of access into all three stages of the treatment process, whether for observation during service or periodic maintenance. The filters include Simul-Wash backwashing technology, which provides advanced media cleaning while minimizing water use, cutting backwash waste.



RESULT:

The refurbishment was completed in September 2017. The city's utilities superintendent reports that the new equipment has rejuvenated the aging plant back to reliable full-service capability, effectively removing iron, manganese and radium from the drinking water supply wells. "We made water the day we fired up," says Michael Klimers, the superintendent. "It met or exceeded our standards and went into storage for sale." **866-663-7633; www.kuritaamerica.com**

Submersible mixer leads to cost savings for plant

Problem

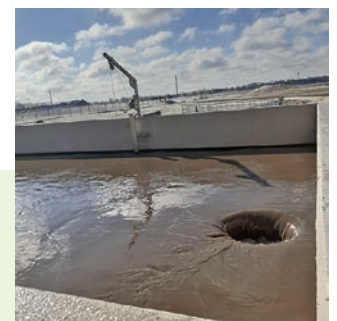
At the 0.5 mgd Valley Center (Kansas) Wastewater Treatment Plant, the cost to repair a failed 7.5 hp mixer was prohibitive. The mixer's seal system had never been user-friendly.

Solution

Fluid Equipment of Wichita recommended a **Landia submersible mixer** expected to last for 20 to 25 years.

RESULT:

The mixer running two hours on and two hours off saves more than \$3,000 per year in electricity. "When the mixer was installed, we turned it on and hadn't seen the basin ever mixed like that before," says Wade Gaylord, utility manager. "The volume the mixer put through, mixing the basin from the bottom up, was pleasantly surprising, changing the dynamics for a much better process all round. All of this with just a 4.9 hp motor." **919-466-0603; www.landiainc.com**



(continued)

Aeration used to oxidize iron for easy removal

Problem

The new groundwater purification facility in Yankton, South Dakota was designed to use reverse osmosis. To remove significant iron, the raw water first needed an aeration step to reduce the loading on the membrane. The plant had to blend with its location in a city park and with the surrounding downtown area.

Solution

The only possible location for a draft aerator would have required replacement of a clock tower with a large and unsightly device on top of the building. Instead the city chose an in-line venturi aeration system from **Mazzei Injector Company**, installed out of sight in the building's basement. It consists of two venturi air injection skids and a 24-inch **Pipeline Flash Reactor**.



RESULT:

The system sufficiently aerates the raw water to oxidize up to 2 mg/L of iron later removed by multimedia filters. The system requires no maintenance and there is almost no mainline pressure loss across the unit. The venturi injector eliminates the need for a blower, compressor and diffuser, reducing maintenance. The compact footprint gave the engineer flexibility to design a plant with an elevated level of architecture without sacrificing function. 661-363-6500; www.mazzei.net

Filter effective at reducing total phosphorus levels

Problem

Upper Montgomery Joint Authority in Pennsburg, Pennsylvania, had an effluent total phosphorus target of 0.1 mg/L at wide range of hydraulic and solids loadings.

Solution

The **Schreiber Fuzzy Filter compressible media filter** from **Parkson Corp.** uses air scouring during the wash cycle to clean the media. The compressible media offers stable and reliable performance despite significant flow and solids loading variation. The filter effectively removes solids created by rapid mixing of ferric chloride followed by flocculation upstream. Besides phosphorus removal, the filter produces a filtrate low in turbidity and TSS.



RESULT:

The filter meets the total phosphorus target without flocculant aids. A study confirmed that it also meets the effluent TSS limit of 5 mg/L and the effluent TDS limit of 1,000 mg/L. It maintains the desired phosphorus removal with solids loading rates from 0.6 to 6 pounds TSS/ ft²/ day. 888-727-5766; www.parkson.com

Geomembrane protects wastewater treatment plant

Problem

The Haikey Creek Wastewater Treatment Plant in Tulsa, Oklahoma, receives wastewater through 36-, 30- and 24-inch force mains. As part of the Broken Arrow Municipal Authority's effort to improve treatment, a geomembrane was needed for the flow equalization basin designed to reduce sanitary sewer overflows.

Solution

XR-5 geomembranes from **Seaman Corporation/XR Geomembranes** were chosen for durability and low thermal expansion and contraction. The membranes are compatible with harsh liquids and offer high UV resistance and tensile strength. They can be prefabricated with fewer field seams than rigid alternatives. This shortens installation time and cost and improves membrane integrity.



RESULT:

These properties along with toughness from the base fabric allow users to leave the liner exposed so that there is no slope maintenance and lower construction and operating costs. 800-927-8578; www.xrgeomembranes.com

BNR technology introduced into conventional activated system

Problem

After new regulations from the Ohio EPA and the Tuscarawas River Total Maximum Daily Load report, the city of Massillon Wastewater Treatment Plant had to increase flow capacity from 15.8 mgd to 17 mgd and meet a total nitrogen limit of 10 mg/L and a total phosphorus limit of 1 mg/L.

Solution

The city chose the **AnoxKaldnes Hybas IFAS system** from **Veolia Water Technologies**. The hybrid process that combines the AnoxKaldnes biofilm technology and activated sludge in the same tank, facilitating creation of additional biomass to meet more stringent effluent standards and increased flow and loading without new tank construction. The design team turned the trickling filter/oxidation ditch into an IFAS-A2O process. To achieve and maximize biological phosphorus removal and denitrification, small anaerobic and pre-anoxic zones were constructed downstream of the primary clarifiers and upstream of the existing aeration tanks. The retrofitted system kept the plant's three-train design. Each train has an anaerobic zone and two pre-anoxic zones, followed by one IFAS zone and one deox zone.



RESULT:

The plant consistently meets its permit limits, producing effluent below 6.0 mg/L BOD₅, 0.2 mg/L ammonia, 8.6 mg/L total nitrogen and 0.3 mg/L phosphorus. 919-677-8310; www.veoliawatertech.com tpo

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people/awards

The Water Environment Federation announces its 2022 WEF Published Papers and Education Awards and recipients of 2022 WEF Operator Scholarships, which provide up to \$5,000 each for those seeking operator education, training, or certification to enter the industry or advance their knowledge, skills or licenses.

PUBLISHED PAPERS AWARDS

Eddy Wastewater Principles/Process Medal: **Onder Caliskaner, George Tchobanoglous, Lilly Imani** and **Brian Davis**, “Performance evaluation of first full-scale primary filtration using a fine pore cloth media disk filter weak water,” in *Environment Research*.

Gascoigne WWTP Operational Improvement Medal: **Jon van Dom-melen** and **Rob Smith**, “Weak-In Worked Out,” in *Water Environment and Technology*.

McKee Groundwater Protection, Restoration or Sustainable Use Award: **Wei-Ting Chen, Ku-Fan Chen, Rao Surampalli, Tian Zhan, Jiun-Hau Ou** and **Chih-Ming Kao**, “Bioremediation of trichloroethylene-polluted groundwater using emulsified castor oil for slow carbon release and acidification control,” in *Water Environment Research*.

Rudolfs Industrial Waste Management Medal: **Amanda Johansen Mattingly** and **Francis Lajara de los Reyes**, “Does bioaugmentation of aerated stabilization basins work? Lessons from field scale trials with a control,” in 2021 WEFTEC Proceedings.

EDUCATION AWARDS

WEF Canham Graduate Studies Scholarship: **Duong Nguyen**, Rocky Mountain Water Environment Association. \$25,000 scholarship honors former WEF executive director, **Robert Canham**.

Student chapter of the year award: **University of Alabama, Young Water Professionals**.

OPERATOR SCHOLARSHIPS

- **Eliseo Bonilla**, Ventura, and **Luis Negrete**, Gardena, California WEA
- **William Branton**, Cohasset, Massachusetts, New England WEA
- **Denton Chas Campbell**, San Angelo, and **Raudel Juarez**, Midlothian, WEA of Texas
- **Jose Gonzalez**, Loxahatchee, Florida WEA
- **Evan Hurrle**, Wilson, Wyoming, Rocky Mountain WEA
- **Derek Jefferson**, Siletz, Oregon, Pacific Northwest Clean Water Assoc.
- **Amanda Martin Akins**, Sparta, and **Glenda Perrott**, Cartersville, Georgia Association of Water Professionals
- **Jonathan Montovio**, Woodbridge, Virginia WEA
- **Katherine Mowbray**, East Jordan, Michigan WEA
- **Todd Saums**, Sylvania, Ohio WEA
- **Jeff Van Andel**, Etobicoke, WEA of Ontario

The **Sequim (Pennsylvania) Wastewater Reclamation Facility** received a 2021 Wastewater Treatment Plant Outstanding Performance award from the Department of Ecology, its third consecutive such award full compliance with its NPDES permit.

Bonita Springs Utilities received the 2022 David W. York Award for

events

Nov. 2

AWWA Water Sector Compensation, Retirement and Benefits Trends webinar. Visit www.awwa.org.

Nov. 2-4

Nebraska AWWA Section Annual Conference, Younes Conference Center, Kearney. Visit www.awwaneb.org.

Nov. 4

AWWA Women of Impact in Water webinar. Visit www.awwa.org.

Nov. 9

AWWA Veterans Transition to the Water Workforce webinar. Visit www.awwa.org.

Nov. 13-17

AWWA Water Quality Technology Conference, Duke Energy Convention Center, Cincinnati, Ohio. Visit www.awwa.org.

Nov. 15-17

Oregon Operators Conference, Douglas County Fairgrounds, Roseburg. Visit www.umpqua.edu/cwt-conferences.

Nov. 15-17

JSWA/EWA/WEF Specialty Conference – Resilience of Water Service, Sendai, Japan. Visit www.wef.org.

Nov. 27-Dec. 1

Florida AWWA Section Annual Conference, Hyatt Regency Grand Cypress, Orlando. Visit www.fsawwa.org.

Water Resources, Reuse, and Resiliency Project of the Year, Public Education Program from the Florida Water Environment Association.

The **Houston Health Department** was recognized by the Centers for Disease Control and Prevention as a National Wastewater Surveillance System Center of Excellence.

Sherry Bradley, director of the Bureau of Environmental Services with the Alabama Department of Public Health and director of the Black Belt Unincorporated Wastewater Project, received the Award of Excellence for outstanding performance and dedication from the State of Alabama.

The City of Goldsboro, North Carolina, named **Robert “Bert” Sherman** public utilities director. He started as a wastewater operator in 1994 and obtained his Grade 4 Operator certification in 1999. In that year he was promoted to wastewater reclamation facility superintendent. He became interim public utilities director in September 2021.

Chris Kenyon retired from the Ionia (Michigan) Department of Public Utilities after 43 years. He had been department director since 1997, following his father, **Wayne Kenyon**. The wastewater treatment facility, known as the Wayne E. Kenyon Building, was renamed the Wayne E. and Chris A. Kenyon Building.

Hardin County Water District No. 2 received an Award of Excellence from the Kentucky/Tennessee AWWA Section for its distribution system in the medium size category (10,000 to 33,000 connections). The Kentucky Energy and Environment Cabinet recognized the district’s drinking water treatment facilities and distribution systems for achieving optimization goals that go beyond U.S. EPA requirements. **tpo**

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