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FEBRUARY 2018

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**Paddling with a purpose**  
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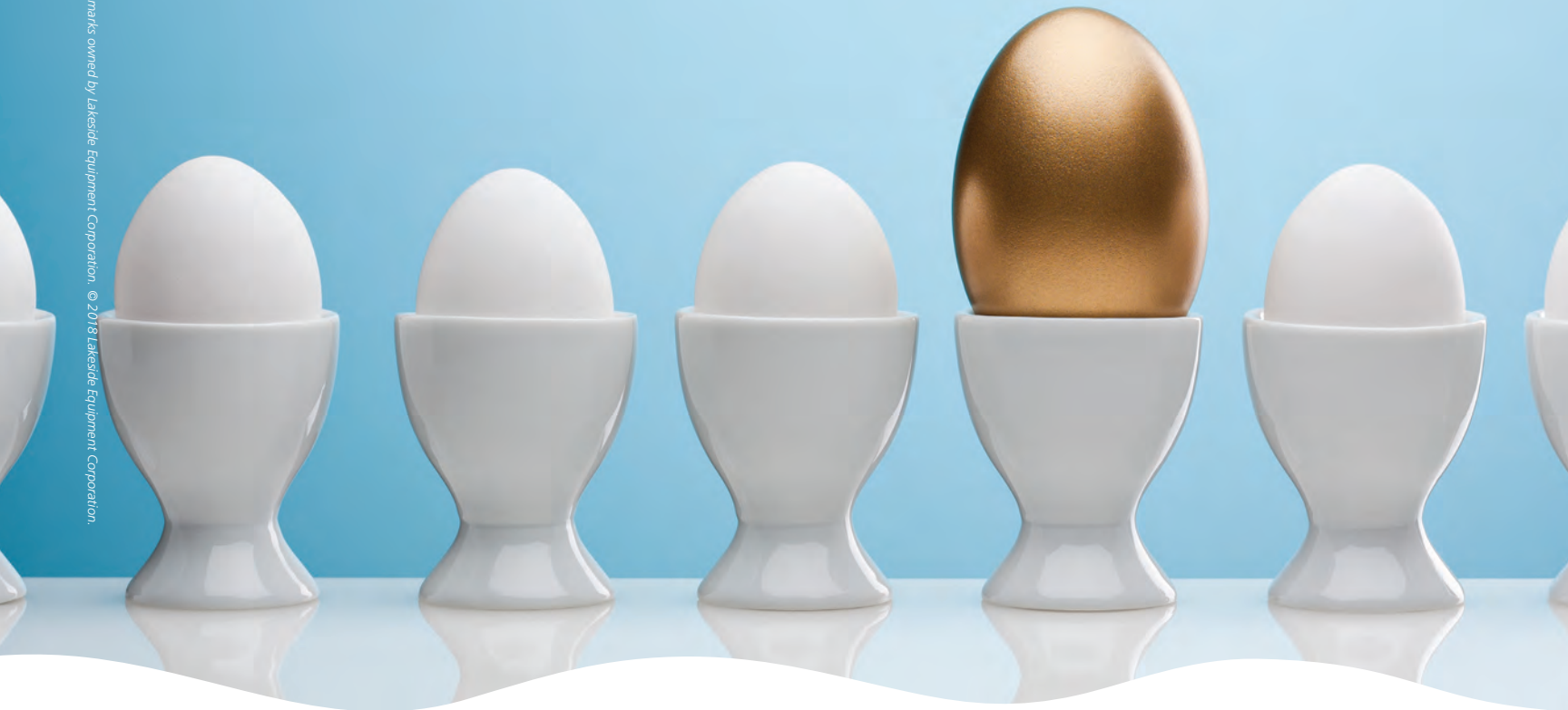


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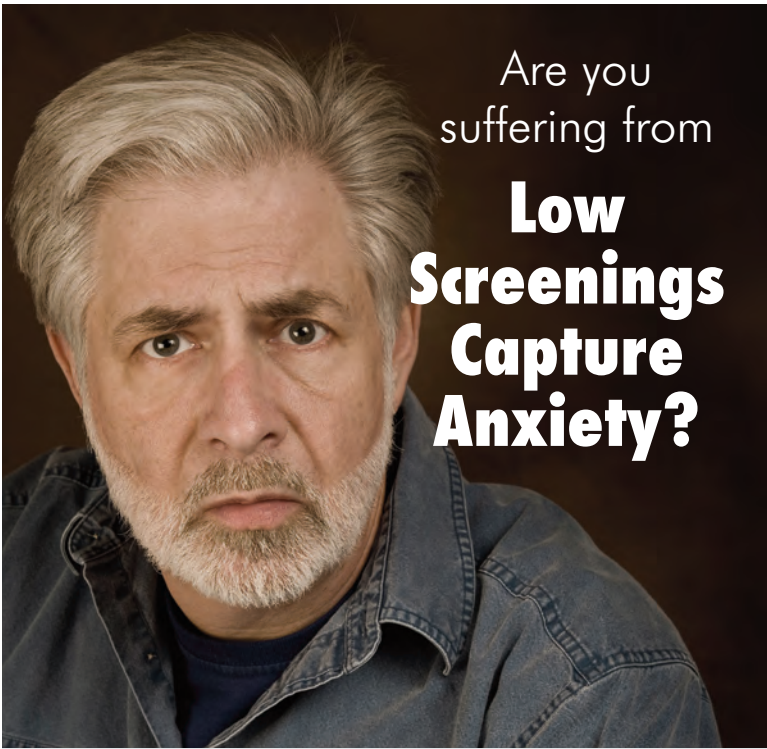
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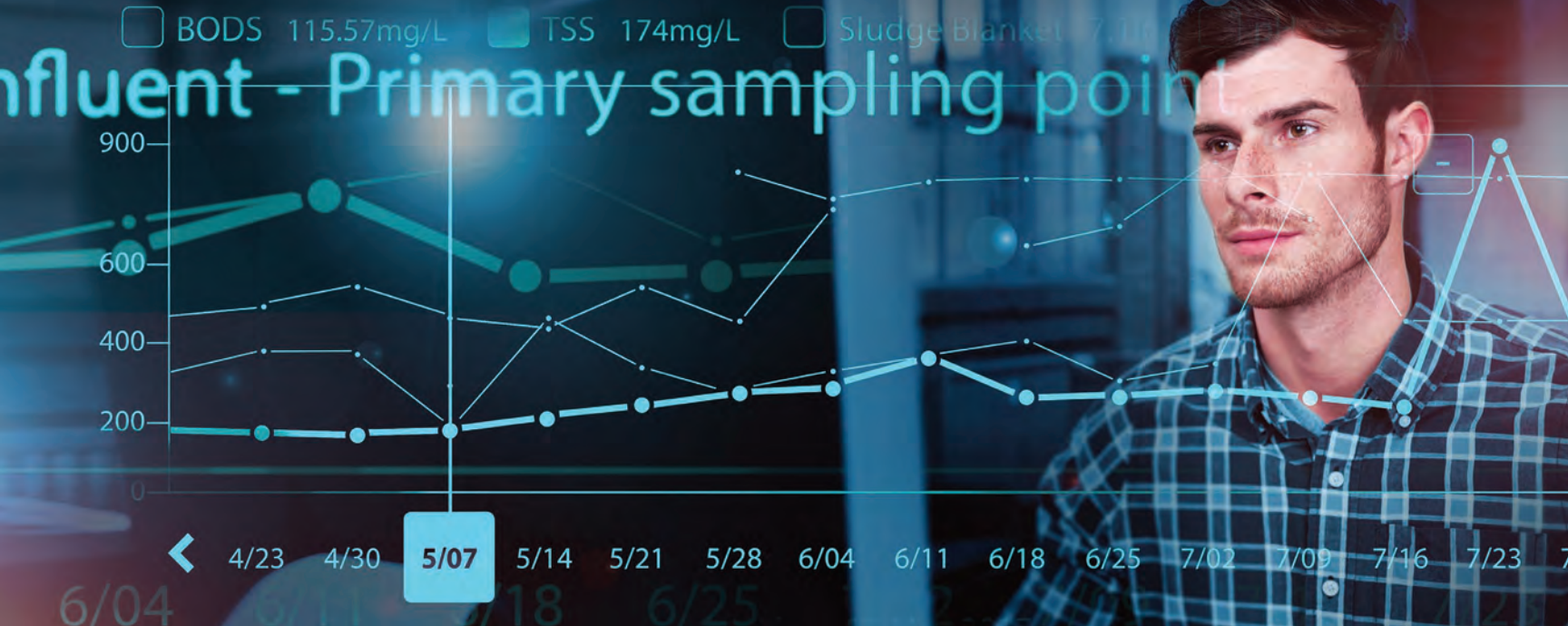
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### on the cover

Studying to be a dentist didn't light a fire of enthusiasm for Suzanne Potts, but it did ignite her love of chemistry and the laboratory. Potts has helped guide the lab at the King County (Washington) Wastewater Treatment Division to highly sophisticated operations. (Photography by Stephen Brashear)

## top performers:

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#### Storm Warriors

Hurricane Irma was just the latest weather challenge fought off by the diverse and experienced operations team in Palm Coast, Florida.

By Jim Force

### WASTEWATER OPERATOR Page 12

#### Starting Over

Cliff Church rebuilt his career from factory work to an award-winning job as reclaim water technician at the clean-water plant in Myrtle Creek, Oregon.

By Jack Powell

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#### Changes by the Minute

An Arizona plant succeeds with operational excellence and dedication, despite rapid raw water quality fluctuations and seasonal algae.

By Trude Witham

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#### Instruments of Change

Suzanne Potts brought a love for science to the task of modernizing laboratory operation for Washington's King County Wastewater Treatment Division.

By Scottie Dayton

### LET'S BE CLEAR Page 8

#### We Have Met the Government, and It Is Us

Never think a group of committed people can't have impacts on government policy. It just takes diligent effort and a sound strategy.

By Ted J. Rulseh, Editor

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Visit daily for exclusive news, features and blogs.

### TECHNOLOGY DEEP DIVE Page 16

#### A Quality Grind

Wipes Ready technology brings a new approach to wastewater grinders and helps treatment plants deal with a persistent and growing problem.

By Ted J. Rulseh

### HEARTS AND MINDS Page 18

#### Treatment on Display

A demonstration facility in Anaheim, California, gives visitors a clear view of processes and delivers reclaimed water for use on city properties.

By Steve Lund

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#### Brilliant Disguise

A Pennsylvania clean-water plant masquerades as a red barn to blend in with its scenic, rolling-hill surroundings.

By Jeff Smith

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#### Clean and Green

The scenic Lake Superior community of Bayfield, Wisconsin, is making waves in driving down energy usage and promoting sustainable utility operations.

By Ted J. Rulseh

### IN MY WORDS Page 44

#### Saving Lives, One Paddle Stroke at a Time

Gary and Linda De Kock plan a fourth self-propelled voyage, this time down the Missouri River, to raise funds for Water For People.

By Ted J. Rulseh

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#### From Brown to Green

A solar array helps an Ohio city power its wastewater treatment plant, lock in electricity savings, and restore a brownfield site to productive use.

By Steve Lund

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#### Biosolids Management and Headworks

BY CRAIG MANDLI

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coming next month: March 2018

#### FOCUS: Pumps

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  - Water Plant: Salem (Virginia) Water Treatment Plant
  - Wastewater Operator: Jim Baird, Roseburg (Oregon) Urban Sanitary Authority
  - Wastewater Operator: Dustin C. Coles, North Topeka (Kansas) Wastewater Treatment Plant
- » Building the Team: A water careers program for high school students
- » Sustainable Operations: Sustainable infrastructure in Seneca, South Carolina
- » In My Words: Promoting reciprocity in wastewater licensing
- » PlantScapes: Birder's paradise in Clark Township, Michigan
- » How We Do It: Improving RTO efficiency in Jacksonville, Florida
- » Hearts and Minds: Recruiting stream stewards in Cobb County, Georgia
- » Technology Deep Dive: FORECTYE wireless equipment monitoring from Nidec



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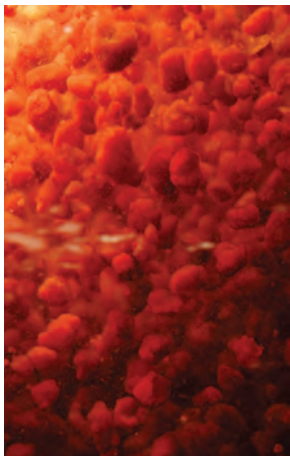
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let's be clear

## We Have Met the Government, and It Is Us

NEVER THINK A GROUP OF COMMITTED PEOPLE CAN'T HAVE IMPACTS ON GOVERNMENT POLICY. IT JUST TAKES DILIGENT EFFORT AND A SOUND STRATEGY.

By Ted J. Rulseh, Editor



In my father's bathroom, there's a cartoon picture of a two-story outhouse. The door on the upper unit is labeled "Government"; the door on the lower unit: "Taxpayers."

It's kind of funny, but also a shade cynical. It's common for people to bash the government: federal, state and local. Heaven knows I've done it. But in my reasoned moments, I remember something: We the people are not underneath the government — we are the government.

That's essential to understand for anyone who wants to influence what government does. I'm not naïve enough to think one person has the same influence as the next. Various people and organizations with money and power have outsized impacts on politics and policy. Still, it's indisputably true that we have a representative government: At every level, we vote people into office, and they are there to serve us to the best of their ability. That's not the same as being there to do exactly what we tell them, but it's part of their job to listen.

### DOING OUR PART

In short, we have something called self-government, and if we don't take part — by voting, advocating for issues, supporting candidates for office, running for office ourselves — we're shirking our responsibility as citizens.

To simply sit around and moan about the horrors of government is the height of futility. It accomplishes nothing. Progress requires action and involvement. In the words of my seventh-grade civics teacher, Sister Jacinta, at Holy Redeemer Catholic School: "You don't like what city hall is doing? Why don't you run for alderman?"

The point is that, though it may not be easy, we can influence government. Multiple channels exist for airing our grievances and offering our proposals. By banding together with other like-minded people and entities, we can bring about change. It may not be easy; it's not supposed to be. But, dogged persistence can move mountains. Squeaky wheels do get greased.

### BEING AN ADVOCATE

To that end, the Water Environment Federation offers a Water Advocates program. It provides practical advice on



**“Politics is the practical exercise** of the art of self-government, and somebody must attend to it if we are to have self-government; somebody must study it, and learn the art, and exercise patience and sympathy and skill to bring the multitude of opinions and wishes of self-governing people into such order that some prevailing opinion may be expressed and peaceably accepted. ... The principal ground of reproach against any American citizen should be that he is not a politician.”

**Elihu Root, former U.S. Secretary of State and Secretary of War**

how wastewater and drinking water utilities and their personnel can band together to become effective players in politics at any level. Here, from the WEF program, are a few quick tips for effective advocacy:

**Know the facts.** To establish and keep credibility, have a grasp of the facts on both sides of an issue. To paraphrase Bob Dylan: Know your song well before you start singing.

**Put the facts to use.** Set them down in one-pagers you can distribute.

**Be clear and concise.** Government officials, the press and the general public have no time for long-winded conversations or lengthy documents. Get to your point quickly, and make it with conviction. Avoid industry jargon that people outside the field won't understand.

**Nurture relationships and work collaboratively.** Advocacy is a joint venture. Find your allies, and work with them. Odds of success are best with multiple organizations and people on your side. Make sure you and your allies have consistent data and the same messages.

**T**o simply sit around and moan about the horrors of government is the height of futility. It accomplishes nothing. Progress requires action and involvement.

**Engage the public.** Use the media, social media, petitions, letters, emails and other strategies to engage the public. Remember that numbers speak loudly to elected officials.

**Make your voice heard.** Kiss the low profile goodbye. Spread the word through meetings, press conferences, letters, petitions, rallies, phone calls and more. Talk up your issue in social settings: You never know where you might find an ally.

**Say thank you.** Government officials are busy; their time is valuable. Keep meetings short, and thank the officials afterward. When your advocacy succeeds, thank those who helped you. **tpo**

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## PFAS PROBLEMS

### EPA Seeks Solution

The U.S. EPA is announcing a cross-agency effort to address perfluoroalkyl and polyfluoroalkyl substances (PFAS). The EPA's efforts aim to build on the work that the agency has done to establish non-regulatory drinking water health advisories for PFOA and PFOS. The agency's water and research offices will lead these efforts and bring together expertise from across the agency.

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## OVERHEARD ONLINE

“What we've done here is essentially created a new category of water-dispersable, biodegradable diagnostics.”

*Startup Company Develops Flushable Pregnancy Test*  
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## HIGH BOD?

### Bug the System

High BOD, backup from filamentous bacteria growth overload, and bad odors at a wastewater treatment plant all signal that something is wrong — and encourage a quick solution. Rather than calling in a civil engineer to do a full plant redesign to keep up with the high treatment demand, biological treatments are opening up which provide a simple and cost-effective solution to handling heavy loads of organic material.

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## SLY DOG

### Detecting Leaks

Early next year, an Australian water utility will deploy a new leak detection tool called Kep. That's the name of an English springer spaniel who is currently being trained in the ways of leak detection by a leading Australian dog trainer, Steve Austin. When Kep is fully trained, she will be capable of locating a leak in water pipes up to 2 feet deep.

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# STARTING OVER

CLIFF CHURCH REBUILT HIS CAREER FROM FACTORY WORK TO AN AWARD-WINNING JOB AS RECLAIM WATER TECHNICIAN AT THE CLEAN-WATER PLANT IN MYRTLE CREEK, OREGON

STORY: **Jack Powell** | PHOTOGRAPHY: **Ethan Rocke**

SORRY, F. SCOTT FITZGERALD, THERE ARE SECOND ACTS IN America. Just ask Cliff Church and his colleagues at the Myrtle Creek Sewage Treatment Plant. Church, his boss and a fellow operator have turned lemons into lemonade after losing their previous jobs by building successful water and wastewater careers in a quiet, forest-products city of 3,400 in southwestern Oregon.

Church, who holds Grade II Wastewater Operator and Grade I Water Operator licenses, received the 2016 Oregon Wastewater Operator of the Year Award from the Pacific Northwest Clean Water Association. The award announcement calls Church “an operator who exhibits a commitment to learn safe and efficient plant operations. ... He is willing to understand the operations of each plant and has shown a mechanical ability by repairing, maintaining and troubleshooting equipment.”

Church, a reclaim water technician, was nominated by Andrew Albee, former Myrtle Creek Public Works director and now superintendent of the clean-water plant in Roseburg. “Right from the start,” he says, “Cliff struck me as a real square guy who cared, was really interested in his work, and didn’t treat wastewater as a just a job.”

Church expressed surprise that he won. “I try to work hard and do a good job for the city and its residents,” he says. “But I had no idea my peers saw me as worthy of an award. It is a huge honor and shows what a great career wastewater has been.”



Cliff Church, reclaim water technician, Myrtle Creek Sewage Treatment Plant


## COURAGE TO START AGAIN

Church has worked tirelessly to learn the business and make sure plant effluent meets all permit requirements for discharge into the South Umpqua River (winter) and a pond at the Cougar Canyon Golf Course in the Umpqua Valley (summer). Past and present supervisors cite his strong interest in treatment processes and plant safety.

Church knew nothing about water or wastewater before 2010, when he lost his job of 20 years at a Roseburg aluminum cable plant, an event that “felt like the end of the world.” Born in Southern California and raised in Myrtle Creek, Church graduated from South Umpqua High School and attended Umpqua Community College for two years before leaving to help at his family’s grocery business.

As one of 78 laid-off workers from the plant, Church enrolled in Oregon’s Dislocated Worker Program, which works with local providers to help workers affected by layoffs and closures. He got a year of paid training in wastewater, learning chemistry, equipment, plant operations and treatment techniques. “I had no idea what wastewater entailed,” he says. “Like most people, I took clean water for granted. But I had lost my job, and as a husband and father, I couldn’t afford to be without benefits or salary very long. The opportunity for a full-time position saved my life and gave me a whole new start.”

Training complete, Church took a job as a wastewater plant operator for the city of Canyonville, about 10 miles south of Myrtle Creek. Although



“ I love this job; there are so many facets to it. You have to know a little bit of everything, and that makes the work interesting.”

CLIFF CHURCH

Church, shown collecting a water sample from the chlorine contact basin, received the 2016 Oregon Wastewater Operator of the Year Award from the Pacific Northwest Clean Water Association.

## Cliff Church, Myrtle Creek (Oregon) Sewage Treatment Plant

POSITION: | Reclaim water technician

EXPERIENCE: | 6 years

DUTIES: | Handle wastewater and treatment operations

EDUCATION: | Graduate of South Umpqua High School; attended Umpqua Community College


CERTIFICATIONS: | Grade II Wastewater Operator; Grade I Water Operator

MEMBERSHIPS: | Pacific Northwest Clean Water Association

GOALS: | Stay at the wastewater treatment plant until retirement

GPS COORDINATES: | Latitude: 43° 1'15.53"N; longitude: 123°17'50.58"W



A man with a mustache, wearing a blue t-shirt and a dark cap, is working with a large piece of equipment. He is holding a blue metal pipe or frame. The background shows a building with a blue roof.

In a three-person operation, Cliff Church has duties that include collecting water samples, doing lab analyses, troubleshooting problems and maintaining equipment.

## SOLD ON SAFETY

For Cliff Church, safety is more than one of his duties: It's a calling he takes quite seriously. In his five years at the Myrtle Creek Sewage Treatment Plant, he has made safety a top priority, becoming Safety Committee chairman and improving committee practices with better organization and consistency.

"When I first met Cliff, he showed some interest in safety, which was great," says Andrew Albee, former director of Myrtle Creek Public Works Services. "I asked him if he wanted to be Safety Committee chairman; he said yes, reluctantly at first. Then, he ran with it and did a good job."

On taking over the committee, Church instituted monthly meetings involving wastewater plant personnel as well as workers from the water, sewer, parks, recreation and other departments. Committee members toured parks to look for hazards, visited playgrounds to make sure the equipment worked as designed, and toured the water and wastewater treatment plants, which have their safety concerns including confined-space entry, guardrails, trip hazards, and the handling of chemicals and biological materials.

Steve Ledbetter, wastewater treatment plant superintendent, says, "Cliff makes sure we're in compliance with all the safety rules and regulations. He takes safety very seriously, and he's good at getting everyone on board with safety measures." The plant has a strong safety record with only one minor lost-time incident and no other major accidents or permanent injuries during Church's tenure. At meetings, he urges attendees to look for anything that might compromise safety anywhere in the Public Works Services department.

"Safety is my forte," says Church, who served on the Safety Steering Committee at the aluminum cable plant where he worked previously. "I've always cared about people and want them to go home the same way they came to work — in a safe manner."

“Cliff is very dependable and is my go-to guy at the plant. ... And he's been our main man on safety pretty much since he started here six years ago.”

STEVE LEDBETTER

pleased to be working at the small plant built in the 1950s, Church longed to be back in his hometown. Six months later, in 2012, the Myrtle Creek operator job opened up; he jumped ship and has been there ever since.

"A friend connected me with Andy Albee, and we hit it off," Church says. "I love this job: there are so many facets to it. You have to know a little bit of everything, and that makes the work interesting."

## MANY ROLES

In a three-person operation, Church does everything from collecting water samples and doing lab analysis to troubleshooting problems and maintaining equipment at the plant, which came online in 2003. With a dry-weather design flow of 1.8 mgd, the plant treats wastewater from Myrtle Creek and its Urban Growth Boundary area — 7,300 total customers — served by the Tri City Water & Sanitary Authority.

Church's maintenance duties cover work on gearboxes, submersible pumps (Flygt - a Xylem Brand), sludge pumps (Vogelsang), an Alfa Laval centrifuge, two clarifiers (WesTech Engineering), cylindrical screens (Andritz Separation) and three Enviroquip PAD process aerobic digesters (Ovivo USA).

He calibrates equipment, changes oil in the machinery and keeps track that everything is working well, including the plant's Orbal four-channel oxidation ditch (Evoqua Water Technologies).

He also maintains a 14-year-old Fenton natural gas dryer (RDP Technologies), which produces Class A biosolids. The dryer dewater biosolids in an enclosed chamber using indirect thermal technology, yielding 108 dry tons per year of granular product for farm, horticultural, municipal and domestic use. Area farmers truck the material away at no cost.

Church and a fellow operator also work a 7 a.m. to 3 p.m. shift and spend Saturdays and Sundays running the 2 mgd, membrane-based Myrtle Creek Water Treatment Plant, a 1 mgd conventional filtration plant, and a spring-fed 0.5 mgd conventional water treatment plant.

## MORE COMEBACKS

"Thank goodness for us Cliff is a heck of a fine worker," says Steve Ledbetter, wastewater treatment plant superintendent. "Cliff is very dependable and is my go-to guy at the plant. In fact, he does the job I used to do. And he's been our main man on safety pretty much since he started here six years ago."

Ledbetter knows all about starting over, as Church did. After nearly 20 years at a Roseburg plywood mill, he was injured and couldn't go back to work. He enrolled in the state's Preferred Worker Program, which helps place workers who have permanent disabilities from on-the-job injuries. That led him to the Myrtle Creek plant, where he began as a trainee and worked his way up to his current role in 2014.

"In terms of wastewater, if I had known how good this career was, I would have gone into it long before I did," Ledbetter says. "People associate wastewater with a lot of nasty stuff, but in fact, it's a great career. I'd like to see more young people get into it because a lot of operators are about ready to retire and we desperately need people to replace them. Plus, it takes time to learn the field; it's not something you master overnight."

Operator Ken Redinger also had to retrain for his job. A long-haul truck driver and then a delivery driver, he injured his back and went through the Preferred Worker Program, training for a year. "I've really enjoyed my time at the water and wastewater treatment plants," Redinger says. "Between Cliff and Steve and the chance to learn new things all the time, it's a pleasure to come to work every day. I've worked with Cliff for a little over three years. He's a super co-worker, and he and Steve and I get along great. It's a pleasure to be around them."

## SECOND CHANCE

Church, a husband and father of four, enjoys fishing, spending time with his grandchildren, and playing fantasy football. He's grateful for the second chance the retraining program provided. And while he may not chide Fitzgerald, author of *The Great Gatsby*, he's a big believer in the power of starting over.

"I plan to stay here till the end of my career," he says with firmness in his voice. "I work with great people and find water and wastewater treatment a rewarding career. For a 40-something-year-old man, it's scary to lose your job and have to begin once more. I'm thankful things turned out the way they did and I came here. It has been a real blessing for me and my family." **tpo**



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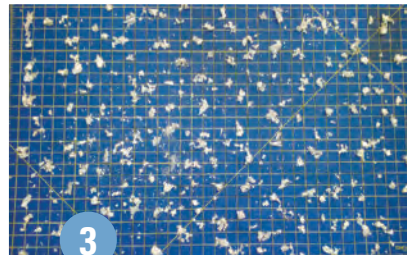
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1. Wipes Ready technology deployed in a Channel Monster configuration.
2. Wipes Ready technology is available on new Muffin Monster (shown) and Channel Monster grinders and for retrofit applications.
3. The cutter reduces wipes and other inorganic solids to small particles.

# A Quality Grind

WIPES READY TECHNOLOGY BRINGS A NEW APPROACH TO WASTEWATER GRINDERS AND HELPS TREATMENT PLANTS DEAL WITH A PERSISTENT AND GROWING PROBLEM

By Ted J. Rulseh

**N**o one in clean-water operations needs to be told that wipes are a problem. Utilities try to educate residents to keep wipes out of their toilets. Wipes manufacturers are working to make their products more flushable.

In the meantime, though, wipes continue to get into collections and treatment systems, where they can clog pumps and cause expensive maintenance problems. That calls for mechanical solutions, most notably sewage grinders.

JWC Environmental, a longtime grinder manufacturer, has developed a technology to help utilities deal with wipes effectively. The company's Wipes Ready technology, available for its Muffin Monster and Channel Monster grinders, received a 2017 Innovative Technology Award from the Water Environment Federation.

Available in new grinders and for retrofits in the field, the technology was recognized for its 17-tooth cutter with serrated edges, a design that cuts wipes and other material in two dimensions, producing a controlled particle that does not reweave into pump-clogging rag balls. The design also includes features to maximize the capture of wipes and feed the material into the grinder.

Rob Sabol, director of research and development, and Kevin Bates, director of marketing and product management, talked about the technology in an interview with *Treatment Plant Operator*.

**tpo:** What was the driving force behind the development of this technology?

**Sabol:** The aim was to reduce the inorganic solids in wastewater and protect pumps and downstream equipment. Many wipes by design are very resilient, and they are tough to grind. Customers told us they were having problems with these wipes getting into pumps and causing shutdowns. The material had evolved beyond the capability of existing technology; we had to do something different to break those wipes down.

**tpo:** How would you describe your approach to the problem?

**Sabol:** First, we looked at the nature of the cloth and did a lot of research and testing of the different kinds of wipes — how they were designed, how they were held together, and how to break them down. We quickly learned that not all wipes are created equal. One thing we found was that if you cut the wipes into strips, the resulting material would twine itself with hair, grease and other debris in the waste stream and form rag balls. We saw a need to break wipes down into a geometry that's less susceptible to rag ball formation.

**tpo:** What kind of geometry is that?

**Sabol:** We wanted to create pieces small enough not to twine with other materials but also large enough not to pass through screens at the treatment plant headworks. Our goal was a confetti cut: particles about a 1/2- to 3/4-inch square.



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### tpo: How is that accomplished in the cutting mechanism?

**Sabol:** Two-shafted grinders are very good at cutting in one dimension, in strips. We had to find a way to cut in two dimensions. The breakthrough was the serrations on the cutters. If you look at a roll of Scotch tape, you drag the tape across a serrated blade. The serrations weaken the material so that it breaks when stretched or pulled. So, the Wipes Ready cutters have serrated teeth that perforate the wipes. And then the differential speeds of the two shafts create a tearing action. That breaks the material into roughly square pieces.

### tpo: How does the technology enable the optimum capture of wipes for cutting?

**Sabol:** We took a two-pronged approach. While developing the Wipes Ready cutter, we looked at how we could enhance the side rail to not only allow water to pass through, but also promote material entry to the cutter. On the Muffin Monster, we have Delta-P side rails with a delta shape, creating a pressure gradient that directs the water flow toward the cutter, so we can get very high volumes of water to pass through and still get great capture efficiency. On the Channel Monster, we can increase the flow even more by replacing the Delta-P side rails with a rotating perforated drum filter. The 1/2-inch hole spacing we use is key to capturing solids and delivering them to the grinder for breakdown while also preventing the stapling of hair and other materials on the outside of the drum and preventing the buildup of grease.

### tpo: Does this technology include any other design innovations?

**Sabol:** Yes. Optimum Cut Control gearing works with the Wipes Ready cutter. Through testing, we determined the gear ratios in the two counter-rotating shafts that create the tearing action to achieve the optimum particle size reduction. We also optimized the clean-out of the cutting chamber to enable processing of material through the system as quickly as possible.

### tpo: What are the relative shares of new Wipes Ready installations versus retrofits?

**Bates:** We're seeing interest equally across customers who already have our equipment and those who need a new grinder in the collections system. As sewage has changed, existing customers have been able to upgrade their systems. Wipes have been growing at 5 to 6 percent a year since 2000, so people who never had problems before are starting to have problems.

### tpo: Can you describe the experience of a specific customer who uses this technology?

**Sabol:** The Rancho Santa Margarita Water District in California had four pumps protected by two-shafted grinding equipment. They were de-ragging the pumps about every two weeks. In 2014, we changed their Channel Monster grinders to the Wipes Ready design with perforated drums and Wipes Ready cutters. They went from de-ragging every two weeks to zero.

**Bates:** They also realized about \$80,000 a year in electricity savings because they no longer have rags in their pumps reducing efficiency. Early adopters like this agency really helped prove out the technology.

### tpo: How would you assess the effect of this technology on the industry?

**Sabol:** It's a terrible job to unclog a sewage pump. Nobody wants to do it, and the safety aspects of it for the workers are significant. JWC Environmental didn't ignore the problem. We didn't go out and try to solve it in a closet. We partnered with people. We talked to customers about their needs and developed a product that deals with the problem successfully. Making that kind of impact on the industry from the company's and my own perspective is really satisfying. **tpo**

# Treatment on Display

A DEMONSTRATION FACILITY IN ANAHEIM, CALIFORNIA, GIVES VISITORS A CLEAR VIEW OF PROCESSES AND DELIVERS RECLAIMED WATER FOR USE ON CITY PROPERTIES

By Steve Lund

Just off a busy downtown street, the California city of Anaheim operates a wastewater treatment plant. It's a small plant, but along with other features of the Water Sustainability Campus next to city hall, it has a big impact.

Known as the Anaheim Water Recycling Demonstration Facility, the plant produces recycled water for toilet flushing in nearby buildings and for landscape irrigation. This drought-proof source of water helps Anaheim irrigate nearby municipal green spaces, even during times of restricted water use. The plant produces 100,000 gpd of recycled water.

The campus features, like drought-tolerant landscaping, permeable pavement and rainwater harvesting, also demonstrate to developers how to incorporate sustainable water features into their projects. The plant helps educate customers about water recycling and the reusability of water resources.

More than 2,000 people have toured the treatment plant since it opened in 2013. Many more have viewed the wastewater treatment process through the glass walls, following signs that describe what goes on inside.

## VISIBLE PROCESSES

"The way it's set up with the piping, you can see the influent come in one clear glass pipe, and you can see the effluent coming out in another glass pipe," says Michael Moore, assistant general manager for water services for Anaheim Public Utilities. "People can see how we make water pure, so we can use it again and again and again."

The plant, designed by MWH Global, receives wastewater diverted from a sewer headed toward the regional wastewater treatment plant. The wastewater goes through a perforated rotary drum screen (WesTech Engineering) and then to biological treatment tanks, first anaerobic and then aerobic.

The third step is a membrane filter (Dynatec Systems), followed by disinfection with ozone (Ozone Solutions) and UV light (TrojanUV). A little

“There are not very many of these decentralized or satellite recycled water plants — small-scale ones like this — especially in a downtown metropolitan area right next to city hall. You can put these anywhere, in any urban area.”

MICHAEL MOORE

bit of chlorine is added to the effluent to prevent bacterial growth in the pipes or holding tanks. The effluent flows through a water feature designed into the building. Any solids collected in the process are diverted back to the sewer system, along with any surplus effluent not used for toilet flushing or irrigation.

An expansion project will soon provide plenty of demand for the recycled water. About 2,300 feet of pipe, a pump system and a storage tank are



The Anaheim Water Recycling Demonstration Facility produces 100,000 gpd of water for landscape irrigation.

being installed so the facility can provide irrigation for Pearson Park, a highly used, 12-square-block site downtown.

One reason Anaheim developed the \$8 million Water Sustainability Campus was to show what could be done in an already developed urban area. "There are not very many of these decentralized or satellite recycled water plants — small-scale ones like this — especially in a downtown metropolitan area right next to city hall," Moore says. "You can put these anywhere, in any urban area. That's one of the big education points, whether it's

elementary school or college students or visitors from other countries who come to see this."

## NO NOISE, NO ODOR

The plant is very close to office buildings in downtown Anaheim, but there have been no complaints

about noise or odor. "We've been able to contain everything within that building," Moore says. "The building looks great. There's no odor. There's no noise coming out. It's a great example of how you can create a sustainable water treatment plant in any urban area."

Noise from aerators, blowers and compressors is controlled by the building's thick glass walls and by having no ventilation outlets near the building. The exhaust goes over to a neighboring parking structure.

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The facility includes a demonstration of landscaping with drought-tolerant plants.

The demonstration plant is a valuable educational resource, Moore says. The effluent cascades down a water feature in the building. Visitors can touch it and even taste it, although the effluent is not rated as drinking water. “They can see it and touch it right there versus us trying to tell them through a brochure or something,” Moore says.

The other features of the Water Sustainability Campus are important, too. “We want to help promote sustainable growth in our city for future development,” Moore says. “We’re able to demonstrate to developers there are ways to do sustainable water practices in their projects. Maybe its drought-proof water, maybe its drought-tolerant landscaping, maybe it’s rainwater harvesting or porous pavement. All these things we’re doing, they could implement.” **cpo**

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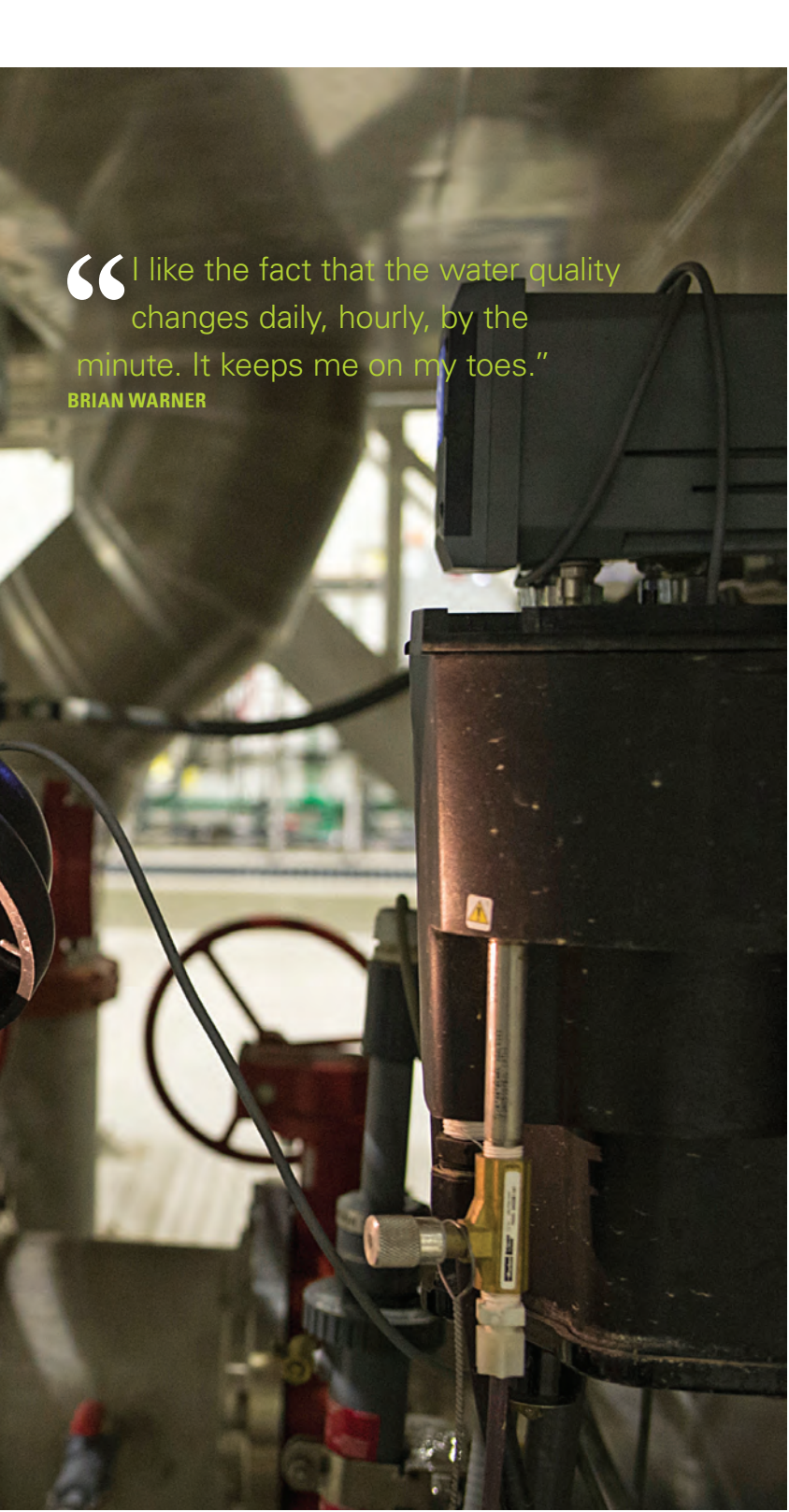
# Changes

## by the Minute

Brian Warner, lead operator, cleans the 2100AN turbidimeter (Hach) in the treatment building at the Superstition Area Water Plant.

AN ARIZONA PLANT SUCCEEDS WITH OPERATIONAL EXCELLENCE AND DEDICATION, DESPITE RAPID RAW WATER QUALITY FLUCTUATIONS AND SEASONAL ALGAE

STORY: **Trude Witham** | PHOTOGRAPHY: **Mark Henle**



“ I like the fact that the water quality changes daily, hourly, by the minute. It keeps me on my toes.”

BRIAN WARNER

WHEN THE SUPERSTITION AREA WATER PLANT began operation in June 2016, customers got to choose the name. “The plant sits at the base of the Superstition Mountains, and that was the name the majority of our users chose,” says Brian Warner, lead operator. The 2.0 mgd (10 mgd design) plant serves about 14,000 people in Apache Junction, Arizona.

Owned and operated by the Apache Junction Water District, the plant draws surface water from the Central Arizona Project canal, which is fed by the Colorado River. Before the \$9 million facility came online, the city of Mesa treated the majority of the district’s water.

The new plant is integrated into the district’s distribution system and provides 80 percent of the water demand; it can supply 100 percent if needed.

Warner deals daily with changing source water turbidity and seasonally with algae outbreaks, both of which he manages with help from instrumentation, lab testing, and experience.

In 2016, the facility won the Small Treatment Plant of the Year and Project of the Year awards from the Arizona Water Association. “We won these awards because we have a great team who planned out a great water plant and a district and board that supports us,” Warner says. The plant also won a 2017 Project of the Year Award from the Water Infrastructure Finance Authority of Arizona.

### FROM IDEA TO REALITY

Warner is the sole operator and handles laboratory testing, grounds maintenance, equipment lubrication/calibration and housekeeping. “I love keeping the plant looking new,” he says. Being the only operator has its challenges. Fluctuations in raw water quality and a recent algae outbreak have caused some headaches.

Warner’s dedication and nearly 20 years’ water treatment experience allow him to meet such challenges head-on. Finished water quality has 0.037 NTU turbidity and 0.6 to 0.75 mg/L chlorine residual. The idea for the plant was first discussed in 2008 and picked up steam in spring 2015. “It took a year to complete,” says Frank Blanco, district director. “Brian came on board three months after we broke ground.” He and Mike Loggins, water district engineer, worked with the contractor and design engineer.

Warner recalls, “I provided feedback on the design, and they made changes based on my input. A big part of that input was to design and equip a lab.” Equipment includes a Hach DR6000 UV VIS spectrophotometer, Hach 2100AN turbidimeter, and pH and conductivity probes. Warner performs daily conductivity, pH, UV254 tests, and compliance testing for turbidity and chlorine.

### CONTROL OF DESTINY

The plant gives the district control over the delivered water quality. “I can monitor the raw water temperature and pH changes and also better examine

## Superstition Area Water Plant, Apache Junction, Arizona



BUILT: | 2016

POPULATION SERVED: | 14,000

SERVICE AREA: | Apache Junction

SOURCE WATER: | Central Arizona Project canal

TREATMENT PROCESS: | Direct filtration

DISTRIBUTION: | 150 miles of pipeline

SYSTEM STORAGE: | 4 million gallons

KEY CHALLENGE: | Changing surface water quality

WEBSITE: | [www.ajwaterdistrict.org](http://www.ajwaterdistrict.org)

GPS COORDINATES: | Latitude: 33°22'19.03"N; longitude: 111°33'50.67"W

Frank Blanco, right, Apache Junction Water District director, talks with Brian Warner in the treatment building.

contaminant levels,” Warner says. “We can store water, ensuring a two-day supply in case of a canal outage.” An emergency generator can run the entire plant if it loses grid power. Indoor and outdoor LED lighting and pumps with variable-frequency drives reduce energy costs.

Raw water enters two self-priming suction pumps (Gorman-Rupp) mounted on a bridge over the Central Arizona Project canal. The water is sent to an automatic strainer (R.P. Adams) for preconditioning and is then treated with aluminum sulfate and polymer. Preconditioned water enters the 1,400 gpm upflow adsorption clarifier (AWC Water Solutions).

Clarified water is sent to two multimedia filters and then to sodium hypochlorite post-disinfection on its way to the finished water clearwell. After contact time, the water is pumped to offsite storage facilities where it undergoes chlorine residual boosting before delivery to customers. The plant is fully automated and has a SCADA system with FactoryTalk ViewPoint software (Rockwell Automation) and four programmable logic controllers with Allen-Bradley processors that Warner can access from offsite.



### HANDLING SOLIDS

Roughly 10 percent of the spent water is recycled back to the head of the plant. “Our wash-water recovery system sends all recovered waters, from the auto strainer, flushing and backwash processes, instrumentation and floor drains, to the equalization basin,” Warner says. From there, the water is transferred to a conical-bottom reclaim tank with a floating decant suction intake. Recycle pumps do the rest.

“We have a timer that allows solids to settle into the hopper bottom of the tank,” Warner says. “We typically allow 30 to 60 minutes of settling time before the decant pumps start.” Accumulated solids are transferred to above-ground thickening tanks. When solids consistency reaches a greater than 30 percent settled volume, the solids are dewatered and removed by a belt filter press (Alfa Laval) and landfilled. Filtrate water from the belt press can be recycled back to the equalization basin for treatment or sent to the wastewater treatment plant.

### DOING IT ALL

Warner started with the district in February 2016. He holds Class 4 Water and Distribution Operator and Class 1 Wastewater Collections licenses. He reports to Loggins (Class 4 Water and Distribution). During



The team at the Superstition Area Water Plant includes, from left, Hazel Hannah, intern; Brian Warner, lead operator; Frank Blanco, Apache Junction Water District director; and Mike Loggins, engineer.

plant startup and commissioning and through the first year, Warner was often at the plant seven days a week, eight to 12 hours a day, and he was on call around the clock. Now, a 40-hour work week is more typical.

In August 2017, the district hired Hazel Hannah, a senior at Arizona State University, as a part-time intern. “She’s majoring in environmental resources management and works weekdays around her class schedule,” Warner says. “She’s been learning day-to-day operations, water quality testing, equipment calibration and maintenance.”

The main treatment challenge is the raw water turbidity. “It can be 10 to negative 20 NTU from February to April,” Warner says. “At least 95 percent

out of Lake Pleasant with water currently in the canal. We also lowered the total volume pumped from the lake. By doing this, we were able to change the ratio of lake versus pass-through water, which is primarily Colorado River water.”

In spite of all this, Warner enjoys the challenges of surface water treatment: “I like the fact that the water quality changes daily, hourly, by the minute. It keeps me on my toes. It also allows me to learn new things while troubleshooting the process, like trying to predict needed changes based on equipment readings and past experience.” *(continued)*

“I can monitor the raw water temperature and pH changes and also better examine contaminant levels. We can store water, ensuring a two-day supply in case of a canal outage.”

**BRIAN WARNER**

of our monthly finished water samples must be less than or equal to 0.3 NTU.”

“The heavy, silty, loamy stuff that settles quickly is easier to remove,” Warner says. “The lighter, fluffy stuff is not easily settled, is very hard to manage, and clogs the filters. The automatic strainer helps. It only takes an hour or so to remove and replace the tubes in the carousel and give the plant a better opportunity to do its job by screening out some of the turbidity before it enters the train. I also have three different pore-size elements with a reverse-wedge wire wrap and a mesh wire orientation, which I use as a toolbox to deal with the changing water quality.”

### DEALING WITH ALGAE

In 2017, a summertime algae bloom in the canal system, which included Lake Pleasant water, created some operating challenges. “The particular offender is a diatom known as Cymbella, or rock snot, that forms long fibers,” Warner says. “It is an intake- and filter-clogging nuisance organism.”

The situation was especially bad in June, when the temperature peaked at 122 degrees F. “The algae was plugging the automatic strainer tubes, forcing the strainer to backwash based on differential pressure every six minutes,” Warner says. “The strainer had to be manually cleaned every two hours, which required shutting down the plant.” During that time, Warner enlisted the help of district staff.

Changing the raw water ratio helped: “We changed the ratio of the percentage of water coming



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Brian Warner collects data during his morning rounds.

## CREATING WITH LEATHER

When he's not running the Superstition Area Water Plant, Brian Warner likes to spend time in his leather shop. "I began tooling leather in 2011," he says. "I create all kinds of hand-tooled leather art: saddles, belts, notebooks, planners, purses, wallets, clutches, holsters ... I build everything but boots."

His creations depart somewhat from the western floral style (Sheridan style) of tooling: "I have adapted the traditional style of opposing circles and flowers, flowing from one to another, and have added different flowers and elements to appeal to the eye and create a distinctive style."

Warner has traveled to industry trade shows that provide vendors, training and workshops. In 2014, he was nominated as eastern regional director for the Colorado Saddle Makers Association, a position he still holds.

He operates commission-only business, relying mostly on referrals and repeat customers. "It's truly a love of my craft and of creating just what my customers want. Most of what I build cannot be purchased in mass-produced quantities." He has a website at [www.brianwarnercustomleather.com](http://www.brianwarnercustomleather.com).

“The heavy, silty, loamy stuff that settles quickly is easier to remove. The lighter, fluffy stuff is not easily settled, is very hard to manage, and clogs the filters. The automatic strainer helps.”

**BRIAN WARNER**

Warner plans to stick around: "This is my home away from home. I start at 6 a.m. and work until I'm done. Although I operate the plant independently, it's the planning and design work of Frank and Mike, and the support of the field and office staff, that make what I do here possible. They're the best." **tpo**

## COMMUNITY OUTREACH

Warner gives back by conducting plant tours through the Arizona Water Association. He and Loggins are involved in the Apache Junction Water Festival, held every April in a park and coordinated by the district, the University of Arizona and other sponsors. It's geared to fourth-graders, who learn about watersheds, groundwater, the water cycle and water conservation.

"We divide the kids into four groups of roughly 20 to 30 and have preset stations where we present 30-minute topics," Warner says. "There are models that show a cross section of the Earth and how surface water and runoff impact the water level in the aquifer, both with pollution and recharge. The teachers provide some pre- and post-festival testing as part of their curriculum. It's been a successful program."

As for the future, Warner sees the plant expanding to its full 10 mgd capacity with the addition of four more treatment trains: "That would depend on whether the state land around our plant is released for development. We have the water rights, so we're poised to make that happen." The plant may also add a sedimentation basin.

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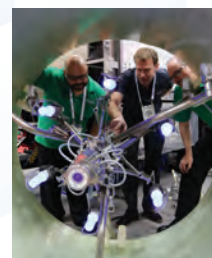
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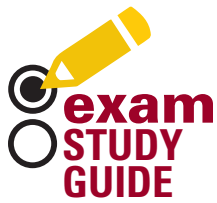
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By Ron Trygar

Licensing exams can be challenging. Our **Exam Study Guide** helps you prepare by presenting questions similar to those on an actual exam. You can find many more sample questions on the *TPO* website at [www.tpomag.com/study](http://www.tpomag.com/study).

## WASTEWATER

Using the breakpoint chlorination method of ammonia removal, approximately how many parts of chlorine are needed to remove one part of ammonia?

- A. Two parts chlorine to one part ammonia
- B. Five parts chlorine to one part ammonia
- C. 10 parts chlorine to one part ammonia
- D. 15 parts chlorine to one part ammonia

**ANSWER:** C. To reach what is commonly referred to as breakpoint, approximately 10 parts of chlorine must be fed to wastewater effluent that contains ammonia. When chlorine and pure water combine, a process known as hydrolysis occurs, producing hypochlorous acid (HOCl), hypochlorite ion (OCl<sup>-</sup>), and hydrochloric acid (HCl). We call this new mixture a chlorine solution. Out of these three products, the HOCl and OCl<sup>-</sup> are the most effective as disinfectants. The water pH and temperature play a part in the ratio of these two compounds.

When the chlorine solution is applied to wastewater effluent, the available HOCl and OCl<sup>-</sup> are consumed by what is known as chlorine demand. Chlorine demand comes from organic and inorganic solids, soluble iron, soluble manganese, dissolved hydrogen sulfide, and nitrite. Nitrite alone accounts for a 5-to-1 demand ratio, meaning that one part of nitrite can consume five parts of available HOCl and OCl<sup>-</sup>.

Once the chlorine demand is met, the chlorine reacts with any ammonia present. This reaction first produces compounds known as chloramines, then essentially destroys the chloramines as the chlorine-to-ammonia ratio increases. Once the chloramines are destroyed, or oxidized by the HOCl and OCl<sup>-</sup>, the breakpoint is reached. The ammonia is oxidized to nitrogen gas and released to the atmosphere, and free available chlorine residual is realized. This entire reaction requires a dosage of about 10 parts chlorine to convert one part of ammonia to nitrogen gas.

## DRINKING WATER

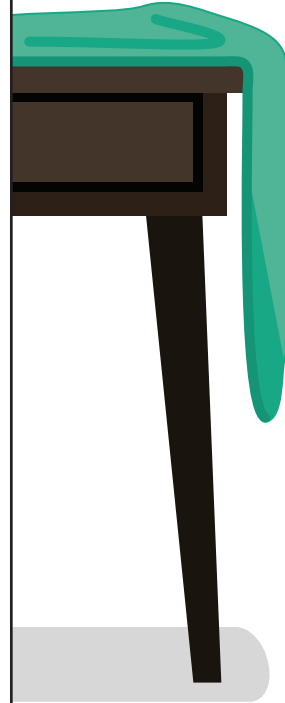
Why is sodium thiosulfate added to sample bottles or sample bags used for total coliform testing?

- A. Sodium thiosulfate increases chlorine efficiency in the absence of air.
- B. Sodium thiosulfate neutralizes only chloramine residual.
- C. Sodium thiosulfate is a method of pretreatment for coliform group bacteria.
- D. Sodium thiosulfate neutralizes all chlorine residual present.

**ANSWER:** D. The total coliform sample is collected as a grab sample from areas of the water distribution system that are representative of the system. This bacteriological sample represents the quality of the water as if it were consumed at that point in time. Sodium thiosulfate removes the available chlorine residual from the sample bottle, as if the water were consumed at that time. The chlorine is neutralized to zero residual by the dechlorinating action of the sodium thiosulfate and must be confirmed as such by the lab analyst before the sample is used in the coliform test method. The interior

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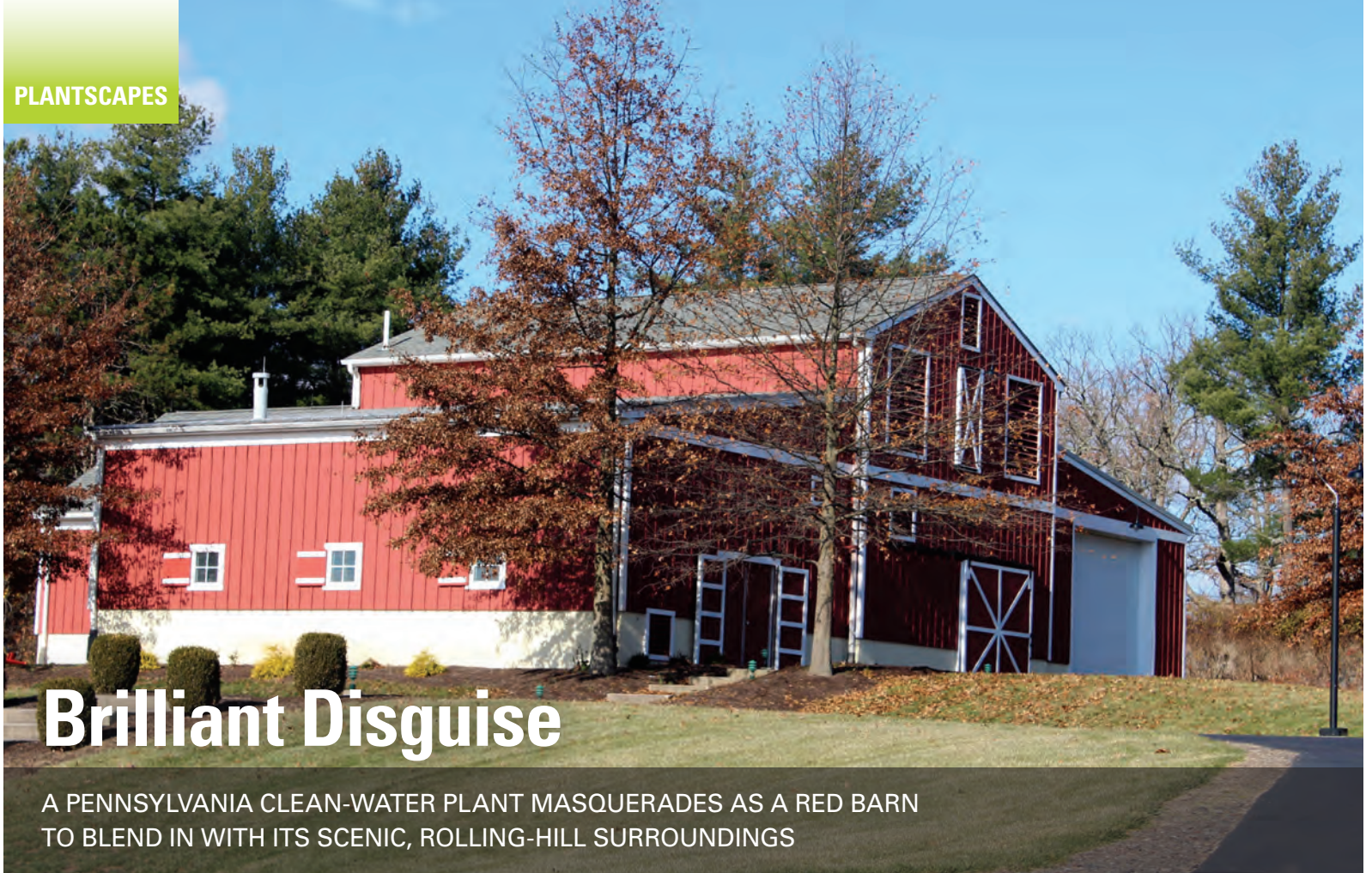
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of the sample bottle, including the dechlorinating agent within, is sterilized before delivery to lab. Do not touch the inside of the bottle or the tablet of sodium thiosulfate, or else false readings may result. The sodium thiosulfate is not a preservative; it is solely for dechlorination of the sample contents. Placing the sealed container with the sample inside on ice in a cooler or in a lab refrigerator to 4 degrees C is considered the preservation method.

### ABOUT THE AUTHOR

Ron Trygar, a certified environmental trainer, is the senior training specialist for water and wastewater programs at the University of Florida TREEO Center. He has worked in the wastewater industry for more than 30 years and holds Class A wastewater treatment operator and Class B drinking water operator licenses in Florida. **tpo**



# Brilliant Disguise

A PENNSYLVANIA CLEAN-WATER PLANT MASQUERADES AS A RED BARN TO BLEND IN WITH ITS SCENIC, ROLLING-HILL SURROUNDINGS

By Jeff Smith

When it comes to hiding a wastewater treatment plant in plain sight, the Hilltown Township Water & Sewer Authority has done it in a way that would be hard to top. Nestled in the rolling hills of Bucks County, Pennsylvania, the 150,000 gpd (design) Highland Park Wastewater Treatment Facility is housed in a beautiful red barn.

“This isn’t your typical barn — it just looks like one,” says Jim Groff, manager of water and sewer for the community in eastern Pennsylvania. Behind the clapboard-covered concrete walls, false barn doors, false windows and a high-pitched roof are two of the first sequencing batch reactors (Aqua-Aerobic Systems) installed in the area.

A concrete post-equalization tank, UV disinfection system (TrojanUV) and a scrubber system (Century) operate out of public view. Sound absorbing panels in the blower room quiet the eight Sutorbilt blowers (Gardner Denver). A false chimney serves as an exhaust stack for the 350 hp diesel standby generator (Cummins Power Products).

## CAREFUL PLANNING

The natural undulations and varied elevations at the plant site provided some challenge to the designers. A three-tiered approach to blending in with landscape meant the screen building is on a higher elevation, the SBRs are at midlevel, and the control building is at the bottom.

“We wanted to do the best we could to make it fit into the landscape and make it look like a Bucks County farm,” Groff says. “It blends in as well as it could.” A car dealership backs up to the plant on one side but is shielded by a large stand of hardwood trees. On two other sides, the facility abuts residential neighborhoods. The fourth side is open to more than 5 acres of wetlands, grasslands and varied landscaping.

“We wanted to do the best we could to make it fit into the landscape and make it look like a Bucks County farm. It blends in as well as it could.”

JIM GROFF

## NATIVE PLANTINGS

Before construction, designers conducted a review of the site to evaluate it and create a hierarchy of natural resources. Objectives were established, such as managing stormwater runoff and preserving wetlands. Protection of lowland and upland meadows was important, as was maintaining a hedge-row of lowland hardwoods and a stand of white pines. The facility and complex underground piping system were located so as to limit disturbances to those areas.

“The facility is well landscaped,” Groff says. “We planted native plants in the stormwater wetland basin and black-eyed Susans and mums near a split-rail accent fence in the front near the road.” A renovated farmhouse on the site houses the authority’s administrative offices. Before construction of the plant, the township pumped its wastewater to a nearby community.

“This was a cooperative effort between a township and a municipal authority to deal with sewage issues while producing a facility that fits well into the landscape and community,” Groff says. In 2004, the plant received the Pennsylvania Arbor Society Award of Excellence for saving and planting trees during construction.

In 2005, the Pennsylvania Horticultural Society presented the facility with the Suburban Growing Greener Award, recognizing the site’s plantings. Groff says, “We actually have had truck drivers making deliveries call us as they drive right by and don’t think it’s a facility.” **tpo**

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“What began as an accident — I never expected to be hired — turned out to be a great career. I found the lab work interesting, intricate, and complex.”

SUZANNE POTTS

Suzanne Potts helped her laboratory graduate from manual process to more efficient and accurate instrumentation.

# INSTRUMENTS OF CHANGE

SUZANNE POTTS BROUGHT A LOVE FOR SCIENCE TO THE TASK OF MODERNIZING LABORATORY OPERATION FOR WASHINGTON'S KING COUNTY WASTEWATER TREATMENT DIVISION

STORY: **Scottie Dayton** | PHOTOGRAPHY: **Stephen Brashear**

STUDYING TO BE A DENTIST DIDN'T LIGHT A FIRE OF ENTHUSIASM FOR Suzanne Potts, but it did ignite her love of chemistry and the laboratory. She switched to environmental science.

An associate degree in environmental science from University of Washington enabled Potts to work for an environmental analytical lab. When it closed in 1994, Potts found what she thought was a temporary job at the King County Wastewater Treatment Division South Plant in Renton, Washington. "What began as an accident — I never expected to be hired — turned out to be a great career," she says. "I found the lab work interesting, intricate, and complex."

Potts helped guide the laboratory from time-consuming manual process analysis and calculations recorded on bench sheets to remote instrumentation and laboratory information management system software. Over her 24 years, she gained a reputation for going beyond the call of duty. From mentoring new staff to being the go-to person for key projects, Potts, a process laboratory specialist III with a Group III Wastewater Operator license, is recognized as a role model throughout her division.

In 2016, Potts received the Laboratory Analyst Excellence Award from the Water Environment Federation and the Pacific Northwest Clean Water Association. In 2017, South Plant earned its 19th Platinum Peak Performance Award from the National Association of Clean Water Agencies.



Suzanne Potts, process laboratory specialist, King County Wastewater Treatment Division

## KEEPING SEATTLE SAFE

In service since 1965, the 325 mgd (design) activated sludge South Plant is one of three facilities serving the Seattle metro area. It averages a dry-weather flow of 96 mgd and treated 26 million gallons of septage in 2016.

Influent passes through eight mechanically cleaned bar screens (Huber Technology), 12 primary sedimentation tanks, and four 4.28-million-gallon activated sludge tanks with four multistage blowers (Turblex Inc. a Siemens Company) and three single-stage blowers (Hoffman & Lamson, Gardner Denver Products). Activated sludge flows to 24 100-foot-diameter secondary clarifiers.

A 12.5 percent solution of sodium hypochlorite disinfects effluent in two channels. Each channel has three 1 hp pumps (Tuthill Vacuum & Blower Systems) with a Water Champ 20 hp rapid-speed mixer (Evoqua Water Technologies). A 9-foot-diameter pipe transfers effluent 10 miles to Elliot Bay.

Mixed sludge is pumped to six dissolved air flotation sludge thickeners (WesTech Engineering), then to four anaerobic digesters before blending in a fifth tank. Liquid biosolids are thickened in three D-Series centrifuges (Andritz Separation), each able to yield a woods application product at 18 percent solids or a longer-haul product at up to 25 percent solids. The plant's Binax scrubbing system produces gas to an 8 MW cogeneration facility that provides hot water in a loop for the digesters, buildings, and underground galleries. The laboratory has five full-time technicians and a full-time temporary technician.

## TAKING THE CHALLENGE

Stepping outside her comfort zone led to a career highlight for Suzanne Potts. In 2011, the King County Wastewater Treatment Division formed the four-member Poofighters team to compete in the WEFTEC International Operations Challenge. Timed events include maintenance, process control, laboratory, safety, and collections.

Potts agreed to join the team after coach Chad Clay mentioned that the competition included a lab event. "I knew I'd be good at it," Potts says. "After saying yes, I learned I'd also be working on pumps and confined space rescues."

"It's hard work, but also great fun with multiple rewards. It helps develop leadership skills and teamwork, provides networking opportunities, and stimulates professional growth. It also gives us a better appreciation for what our co-workers do. My lab coworkers willingly shouldered part of my responsibilities while I trained and was gone for competitions. Without their support, I wouldn't have been able to participate."

The Operations Challenge presented Potts with some steep learning curves. For the 2014 collections event, she helped connect a 4-inch lateral to an 8-inch pipe and then identified six pipe defects on an inspection photo using NASSCO pipeline assessment certification program codes. Lacking experience in pipe assessment, Potts spent hours memorizing what fractures, cracks, and corrosion looked like and their codes. Manuals and notes are not allowed during the test, and any mistake adds time to the score.

After identifying the defects, Potts helped fasten Fernco couplings and a service saddle to the pipe. "The pressure is on to do everything quickly and accurately, all under the watchful eyes of hundreds of spectators cheering as loudly as crowds at Seahawks games," Potts says.

Events are choreographed like a dance; each member knows exactly where to be and what to do every second. "Competing takes commitment, dedication, and hours of practice for that rare opportunity to show people why we're proud of the work we do," says Potts, who scored 100 percent on the collections test.

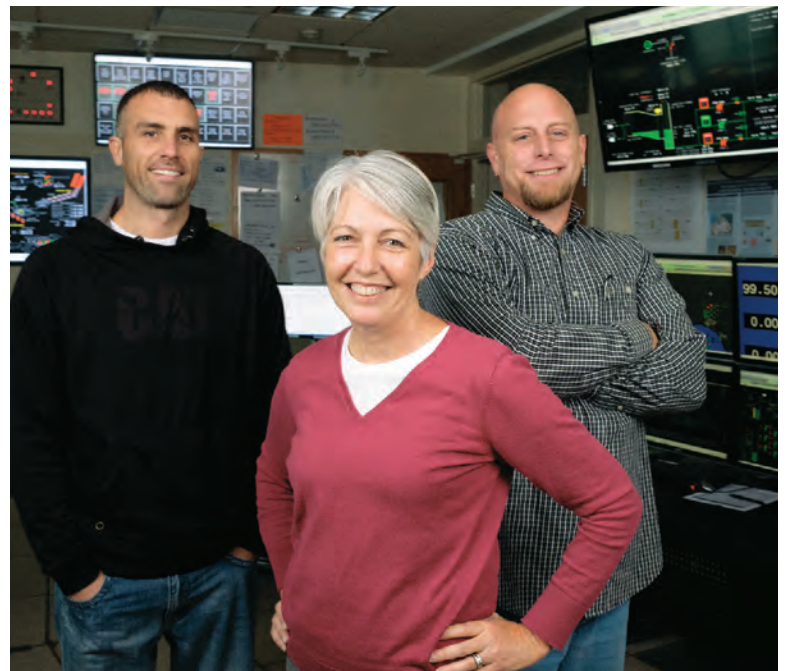
The division rotates personnel to enable multiple operators to compete. In 2016, Potts was the only original Poofighter. Last year, she gave up her spot, but she continues to help train the team and hopes to attend the Pacific Northwest Clean Water Association conference as an Operations Challenge judge.

## MAKING INROADS

Not everyone in the lab welcomed the technical advances Potts proposed, fearing they would work themselves out of a job. But the operators gave Potts and Curtis Steinke, process analyst, their full support as they campaigned to eliminate multiple samplers throughout the plant.

"The operators collected composite samples daily, then brought all those bottles to the lab," Potts says. "Furthermore, the samplers were old and required lots of monitoring and maintenance." After the county purchased probes integrated with SCADA software, Potts verified their data against samples she drew and analyzed in the lab. The probes improved process efficiency and reduced operation and maintenance costs.

In 2012, the 36 mgd (design) Brightwater membrane bioreactor came online, doubling South Plant's lab work. Simultaneously, the laboratory was razed to build a two-story structure, forcing technicians to establish lab space



Potts, shown with plant operators Dustin Harris (left) and Darek Kenaston, acts as a mentor to team members at her facility.

## Suzanne Potts, King County Wastewater Treatment Division, Seattle, Washington

POSITION: | **Process Laboratory Specialist III**

EXPERIENCE: | **24 years**

EDUCATION: | **Bachelor's degree, environmental science, University of Washington**

CERTIFICATIONS: | **Group III Wastewater Operator**

MEMBERSHIPS: | **Pacific Northwest Clean Water Assoc., Water Environment Federation**

GOALS: | **Provide leadership, mentor co-workers, improve lab quality and efficiency**

GPS COORDINATES: | **Latitude: 47°35'55.41"N; longitude: 122°19'50.98"W**



in other areas of the plant and in a temporary trailer. "Hiring help wasn't in the budget, so we invested in equipment to improve efficiency," Potts says.

Leading the way was the AQ2 auto-analyzer (SEAL Analytical) to expedite test results for phosphorus, nitrate, and nitrite. Compared with manual methods, it uses 2 ml samples instead of 100 ml and about 80 percent less reagent and glassware. It also runs automatically, freeing technicians for other work.

## TIME AND SPACE SAVINGS

Three 8-tube Tecator digestion systems and scrubbers (Foss) for TKN analysis replaced a leaky, dirty, wall-sized digestion unit with fume hood that used 300 ml samples and a mercury catalyst. The new units have a smaller footprint, use 25 ml samples, and work with nonmercury digestion reagent (North Central Laboratories).

"We used to run daily TSS samples on mixed liquor, one each, four trains, along with return activated sludge and unchlorinated effluent, one each from six pods," Potts says. "Installing TSS and total solids probes reduced the number of samples we ran to verify readings weekly or every other week. This saved lab time and benefited general operations because we didn't have to clean and maintain the composite samplers."

A TitroLine automatic titrator with TitroSoft software (SI Analytics) is the newest addition. The lab sometimes runs as many as 20 daily alkalinity

*(continued)*





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samples ranging from less than 10 mg/L to more than 8000 mg/L. “It was very time consuming,” Potts says. “Now, we set the samples on a carousel and let the titrations run while we do something else. It probably saves an hour of bench time per day.”

The new lab’s layout also enhanced efficiency, and the improved sample receiving area accommodates the numerous samples from South, Brightwater, and the smaller Carnation (480,000 gpd) and Vashon (1.4 mgd) treatment plants.

## MOVING AHEAD

Potts’ desire to become a level III process lab specialist required a bachelor’s degree. While in her early forties, she returned to the University of Washington. “My then supervisor, Barbara Strutinski, and current supervisor, Teresa Allen, were encouraging and gave me lots of latitude to complete my studies,” Potts says. “Nevertheless, working full-time, attending classes, and raising a teenage son were demanding, hard-won challenges. And I’m proud of my degree.” She graduated in 2005 with a bachelor’s degree in environmental science.

After almost a quarter century in the lab, Potts still enjoys the routine. Three new lab specialists, hired to replace retirements or transfers, have added mentoring to her agenda. She says the core part of the job takes about a year to master, but gaining the process control experience to evaluate data and take the proper actions require years.

“As I contemplate retirement, I’m thinking more about how to pass on my knowledge,” Potts says. “I’ve considered writing a lab manual, but where do I find the time? And I’ve been here so long that sometimes I don’t realize the little pieces of information in my head are not written down.”

## RESULTS AND IMPLICATIONS

Detection work remains Potts’s favorite aspect of the job. When certain samples fall outside the normal range, the game is afoot. Culprits could be a process change, a sampler issue, or something unexpected coming into the plant. For example, the plant’s bioselector process requires monitoring the phosphorus uptake across the aeration tanks. “When we see higher phosphorus levels in the effluent, we need to understand what that means from a process perspective,” Potts says. “Providing information that enables operators to make the necessary adjustments is exciting.”

“As I contemplate retirement, I’m thinking more about how to pass on my knowledge. I’ve been here so long that sometimes I don’t realize the little pieces of information in my head are not written down.”

**SUZANNE POTTS**

Her latest project is working with the King County IT team to integrate lab instruments with a new lab information management system (Thermo Fisher Scientific). Work to implement the new system began in early 2016. Potts is helping with rigorous testing to ensure the calculations built by the vendor work and have the required specific embellishments. One customization involved more than 100 weekly TSS samples. Upon verification, calculations are integrated with the instruments and brought online.

## CAREER CHALLENGE

The Laboratory Analyst Excellence Award was a highlight of her career, but Potts views it as an honor for her team. “No one approaches you on the street to thank you for working in the sewer department,” she says. “The job is not a great topic at dinner parties. So when you’re recognized, it has to be a thank you to the entire group.”



Potts serves as an advocate for the water professions as a source of rewarding careers.

She believes strong outreach would remedy the lack of public recognition: “We must do a better job of stressing the well-paying, rewarding careers and great benefits available at treatment plants. As a huge portion of the workforce reaches retirement age, it’s more important than ever.” **tpo**

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PHOTOGRAPH BY TED. J. RULSEH

Biosolids from the wastewater treatment plant anaerobic digester are pumped during summer to a pair of reed beds in concrete enclosures.

# Clean and Green

THE SCENIC LAKE SUPERIOR COMMUNITY OF BAYFIELD, WISCONSIN, IS MAKING WAVES IN DRIVING DOWN ENERGY USAGE AND PROMOTING SUSTAINABLE UTILITY OPERATIONS

By Ted J. Rulseh

**A** clean environment means everything to the city of Bayfield, located on a peninsula in Lake Superior at the northern tip of Wisconsin. About 500 residents call Bayfield home, but tens of thousands of tourists visit in summer and fall to enjoy the lake scenery, tour the Apostle Islands National Lakeshore, visit orchards atop the surrounding hills, and patronize shops and restaurants near the lakefront downtown.

To help maintain its attractiveness to residents and visitors alike, the city in 2012 adopted a comprehensive Sustainability Plan that covers housing; transportation; agricultural, cultural and natural resources; economic development; intergovernmental cooperation with other nearby communities; land use; and utilities and community facilities.

In addition, in 2006, the City Council passed a resolution adopting the Natural Step Framework and joined communities that have designated themselves as eco-municipalities.

## SUSTAINABLE UTILITIES

Mayor Gordon Ringberg observes, “Sustainability is about doing the right thing, but it also makes sense for where we are and what our livelihoods are based on. We want to protect the lake, the woods, and everything around us for ourselves as residents, for our visitors, and — more important — for future generations. This is a special place, and we want to keep it that way.”

Tom Kovachevich, Public Works director, and Josh Pearson, wastewater treatment plant operator, are integral to the utilities portion of the Sustainability Plan. They’ve worked on energy-saving and other sustainability projects affecting drinking water pumping, treatment and distribution, and wastewater collection and treatment.

The city is by far the smallest of five participants in the Water Utility Energy Challenge, a competition funded by the Great Lakes Protection Fund and managed by the American Water Works Association. The communities

are competing to see how well they can change their operations to reduce the air pollution — especially mercury releases — created by electricity production.

## EFFICIENT TREATMENT

The Bayfield water and wastewater utilities have taken various steps to drive down energy consumption and improve efficiency in general. The city pumps its water from two wells on the hills just a few blocks inland from Lake Superior. From two reservoirs, the water flows by gravity through the distribution system. The source water is of such high quality that it requires only low-level chlorination to achieve a chlorine residual of 0.08 mg/L.

The water pumping operation has been the focus under the Water Utility Energy Challenge, according to Pearson. Normal daily pumpage is about

“We want to protect the lake, the woods, and everything around us for ourselves as residents, for our visitors, and — more important — for future generations. This is a special place, and we want to keep it that way.”

**MAYOR GORDON RINGBERG**

60,000 gallons, although it can reach as high as 250,000 gallons during the peak tourist season.

For the contest, brought to leaders’ attention by Sarah Mather, office assistant, Pearson first established a baseline of pump operation patterns. “I installed radio reads at our pump houses to detect when the pumps call for water and turn on,” he says. “We let that run for a while to determine at what times of day the pumps were running.”

The resulting data showed that some pumping times were falling in periods of high mercury emissions from coal-fired utility power plants. “It’s our goal under the competition to avoid pumping during those times,” Pearson says. “We decided the best way to do that was to manually start the pumps and



The city of Bayfield team includes (front row from left) Sarah Mather, office assistant; Josh Pearson, wastewater treatment plant operator; (back row) Tom Kovachevich, director of Public Works; and Gordon Ringberg, mayor.



The oxidation ditches at the treatment plant are fed by a blower fitted with a variable-frequency drive.

fill the reservoirs first thing in the morning, when mercury emissions are lowest. So we run our pumps at that time until the reservoirs are full and then turn them back to auto so that they will start in case of a fire or other emergency.

“At some points, especially during high-usage periods on weekends when no one is in the office, we still run at the high mercury-emissions times because of water demand. But during the week, we’ve done pretty well at controlling our pump times.”

### MORE EFFICIENCIES

Efficiency initiatives extend to the wastewater treatment plant, the first advanced treatment facility in Bayfield County, commissioned in 2006. The pumps that lift wastewater to the hilltop treatment facility are fitted with

variable-frequency drives, and so is the VFD that drives the aerator for the two oxidation ditches. Aeration is controlled on a feedback loop to sustain the optimum dissolved oxygen level and avoid excessive power consumption.

Biosolids management includes a unique system in which material from the anaerobic digester at about 1.5 percent solids is pumped into a pair of reed beds in concrete enclosures. Pumping at about 17,000 gpd occurs about four days per month during summer.

Meanwhile, substantial work is being done to reduce inflow and infiltration to the sewers and the loss of potable water to leakage. About 70 percent of the water piping has been replaced in recent years. “We have removed a lot of clay tile pipe and put in PVC,” Pearson says. “We’ve replaced almost

all 4-inch water mains with mostly 8-inch lines and larger.” Periodically, the city has hired a contractor to listen for leaks with acoustic equipment; that has helped locate problem areas for repair. Losses have declined from about 25 to 20 percent.

When doing street repairs, the city also replaces the underlying sewers and water mains; drain tile is installed in some cases to divert high groundwater away from the sewer lines and limit I&I. Where possible, crews use directional drilling to install piping, thus avoiding major disruptions that would inconvenience tourists.



A wellhead pump lifts groundwater to fill the city’s main reservoir.

### OTHER INITIATIVES

Steadily pursuing sustainable options, Bayfield has worked with Wisconsin Focus on Energy to complete a citywide energy audit and install efficient lighting. LED lamps, purchased from Great Lakes Electrical Equipment with financial assistance

from Focus on Energy, have been installed inside and outside the water and wastewater treatment plants, the administration building, and the Public Works shop. Street lamps have been replaced by LEDs, and traffic lightbulbs are to be replaced as well.

The energy audit recommendations include installing VFDs on the two well pumps and working with the local electric utility, Xcel Energy to procure lower interruptible rates for facilities equipped with backup generators. Those include the wastewater treatment plant and the larger of the two wells.

For the future, the Sustainability Plan calls for exploration of renewable energy. “We’ve looked at the possibility of putting in solar panels to reduce the amount of electricity we pull off the grid,” says Ringberg, who often rides an electric bicycle between his home on a hill and city hall on the lakefront.

“When we buy equipment, we want it to be at the upper end in terms of being environmentally friendly. We do what we can to avoid overtaxing the resources. It takes about 100 years for a drop of water that enters Lake Superior to work its way out. So whatever we put into the lake will be there for a while. It affects the lake trout, the fishing, and the health of everything in the lake. We keep sustainability in mind and do as much as we can, knowing there is always more we can do to keep working toward our ultimate goals. It’s important for us — we take it very seriously.” **tpo**

# Storm Warriors

HURRICANE IRMA WAS JUST THE LATEST WEATHER CHALLENGE FOUGHT OFF BY THE DIVERSE AND EXPERIENCED OPERATIONS TEAM IN PALM COAST, FLORIDA

STORY: **Jim Force** | PHOTOGRAPHY: **Rob Herrera**

PLEASE EXCUSE THE STAFF AT THE PALM COAST WASTEWATER Treatment Plant No. 1 for complaining about lousy weather.

Hurricane Irma was just the latest in a series of storms and wet-weather events that have kept them busy managing high flows in the plant and collections system. “In my 36 years in the profession, it seems like this has been one of the most unusual as far as rainfall is concerned,” observes Danny Ashburn, manager of wastewater operations. “It started raining in July. On top of that, we got a hurricane and then two nor’easters that funneled rain on us for 36 hours.”

The 15 inches of rain on already saturated ground doubled the plant flow and made it challenging to keep the system operating. “It affected us pretty heavily,” Ashburn says. “The longer it goes on, the more susceptible we are to failures.”

But Ashburn, chief operator Pat Henderson, lead operator Marco Pubill and their team have been up to the task. The 6.8 mgd (design) plant has maintained compliance despite the weather. It received a 2016 Plant Operations Excellence Award from the Florida Department of Environmental Protection and Florida Rural Water Association.

## ADVANCED TREATMENT

The plant serves 82,000 residents plus commercial accounts in Palm Coast, which stretches for several miles between St. Augustine and Daytona Beach. Built in 1972 and expanded four times since, the facility uses biological nutrient removal and advanced filtration to achieve a high-quality effluent that is mostly reused for irrigation and groundwater recharge.

From the influent wet well, raw wastewater passes through a pair of vertical mechanical bar screens (Parkson) and then to a grit removal system that consists of a cyclone section and a screw compactor section (Waste Tech). Three 15-foot-deep racetrack oxidation ditches follow, measuring 125 by 55 feet, with surface aerators and mixers.

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Parkson installers Ryan Brice (left) and Pete Peña install a Parkson perforated bar screen at the Palm Coast Wastewater Treatment and Reuse Facility.



Parkson

FilterONE USA

“Our staff is critical for cleaning and maintaining the equipment. They take care of all mechanical repairs and all maintenance activities, in addition to operating the plant and making sure everything is running correctly.”

**PAT HENDERSON**



## STRETCHING FOR SAFETY

While most treatment plant operators might head for the coffee pot first thing in the morning, the routine is a little different at Palm Coast. The first shift spends at least 15 minutes in the lunchroom in group Exercise, stretching out the muscles while mentally focusing on safety.

“Every morning, we stretch together,” says Marco Pubill, lead operator. The staff began the routine about a year ago, starting with training sessions led by an expert from a local gym. The stretching exercises correlate well with safety: “By stretching your body, you help eliminate back injuries,” Pubill says. “It’s a safety-minded start to every day.”

Pat Henderson, chief operator, adds, “It’s a primer. It gets your mind set to do your work properly and safely.”

Robin Cathey, Operator 1, measures a clarifier blanket level.

total solids, is pumped to a 6-million-gallon storage tank before reuse or discharge to the Intracoastal Waterway, about three miles away.

Biosolids are aerobically digested, thickened, dewatered in centrifuges (Andritz Separation), and stored in a dump trailer. A private hauler takes about five loads per week, at 18-percent solids, to a local composting site.

The ditches, two supplied by Lakeside Equipment and one from Kruger USA, provide biological treatment including nitrification and operate in a phased single-ditch mode of the BIO-DENITRO process (Veolia Water North America). Team members monitor dissolved oxygen as the main operating parameter and plug the data into the plant’s SCADA system, supplied by Kruger USA with Square D control centers (Schneider Electric) and programmable logic controllers.

Treated water settles in six 65-foot-diameter clarifiers (Ovivo USA). Four Hydrotech Discfilters (Kruger USA) polish the effluent before it is chlorinated with liquid sodium hypochlorite and dechlorinated with liquid sodium bisulfite. Filtered water, meeting a reuse quality standard of less than 5 mg/L

Henderson notes that to meet future treatment needs and to serve the far north end of the community, Palm Coast is constructing a second 5 mgd plant. “The new plant will take care of the growth of the community for at least the next five years,” he says. The community stretches a long way from north to south, and the new plant will take pressure off collections system pumps, which now must move water long distances.

## RECYCLING AND REUSE

For decades, the state of Florida drained land areas and pumped water to the ocean. Today, however, the state practices water reuse to replenish the aquifer and extend potable water supplies. Palm Coast is doing its part.





Facility team members include, from left, Tipo Toomalatai, Operator 3; Chris DeBattista, John Bryl and Chris Sleep, operator trainees; Danny Ashburn, wastewater manager; Patrick Henderson, chief operator; Eric Stodola, Operator 1; Marco Pubill, lead operator; and Keith Jones and Robin Cathey, Operator 1.

“Most of the year, we supply treated effluent to area golf courses, highway median strips, and about 400 homeowners for spray irrigation,” Ashburn says. “We also sell recycled water to Hammock Dunes, an oceanfront resort development, which doesn’t have enough irrigation water to supply its golf courses and residential community.”

The Palm Coast reuse system dates from the installation of the plant’s filtration system in 2006 and reuse pumping facilities in 2008. The pumping stations keep the water constantly pressurized; usage is based on demand. Excess water is recycled to the groundwater through rapid infiltration basins in sandy areas around the community. During summer, essentially all effluent is reused for irrigation. In winter, more water is pumped to the infiltration basins. When they are fully charged, the excess is discharged to the Waterway.

### SHARED DUTIES

The plant operators have diverse skills. “We don’t have a separate maintenance department,” Henderson says. That means the plant’s 10 operators fill both operational and maintenance roles. One staff member is assigned to enforcement of the utility’s FOG ordinance and works outside the plant inspecting grease traps.

In addition to Ashburn, Henderson, and Pubill, the team includes operators Tipo Toomalatai, Eric Stodola, Keith Jones, and Robin Cathey; operator trainees Chris DeBattista, Chris Sleep, John Bryl, and Dan Niemann; and Pat Garrett, pretreatment inspector.

## Palm Coast (Florida) Wastewater Treatment Plant No. 1



BUILT: | 1972; four expansions

POPULATION SERVED: | 82,000 connections

SERVICE AREA: | City of Palm Coast

FLOWS: | 6.8 mgd design, 6.2 mgd average

TREATMENT PROCESS: | Oxidation ditch, cloth disc filtration

TREATMENT LEVEL: | Tertiary

RECEIVING WATER: | Groundwater recharge, Intracoastal Waterway, irrigation

BIOSOLIDS: | Composted

ANNUAL BUDGET: | \$1.9 million (operations)

WEBSITE: | [www.palmcoastgov.com](http://www.palmcoastgov.com)

GPS COORDINATES: | Latitude: 29°32'58.65"N; longitude: 81°12'24.41"W

“Our staff is critical for cleaning and maintaining the equipment,” Henderson says. “They take care of all mechanical repairs and all maintenance activities, in addition to operating the plant and making sure everything is running correctly.”

Safety is paramount. “We provide our operators with all equipment necessary to do the job safely,” Henderson says. Safety meetings are held at the plant twice a month. Operators also take part in the city’s safe driving program.

It’s working. In 2016, the plant recorded zero lost-time accidents; it received a 2017 Safety Award from the Florida Water Environment Association for Class B facilities. “We’re proud of our excellent safety record,” Ashburn says. “It ultimately benefits our overall operation to give the best service possible to our citizens.”

### EMERGENCY RESPONSE

The Palm Coast staff also deserves praise for storm-proofing the wastewater operation.

## Palm Coast Wastewater Treatment Plant No. 1 PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT
<b>CBOD</b>	194 mg/L	2.3 mg/L	20 mg/L
<b>TSS</b>	142 mg/L	1.2 mg/L	Reuse: 5 mg/L Restricted access reuse: 20 mg/L Waterway discharge: 20 mg/L
<b>Nitrogen</b>		9.8 mg/L	Restricted access reuse: 12 mg/L Waterway discharge: 20 mg/L

As hurricanes and rainstorms pass through, the plant's flow can double, the collections system can become overwhelmed, and pipes can break. "We get some solids loss, but it's mainly a hydrological event, and the plant can handle it pretty well," Henderson says. "We also get a lot of sand in the influent."

The community has a number of on-site tanks that serve individual homes. The utility owns the tanks, which act like septic systems but discharge to the plant, adding to the overflows during storms.

Preparation is the key. Palm Coast maintains standing contracts with a number of vacuum truck firms. They can be called in during storms to relieve pressure on pump stations and overflowing manholes. "It's also important to have your emergency generators ready to go and get them out into the field as quickly as possible," Henderson says.

The plant has hurricane shutters for all windows. Team members keep loose equipment tied down and all electrical systems and pump stations in good shape. In anticipation of bad weather, vehicles are kept fully fueled and chemicals topped off. "That way, when events come through, we don't have failures that hinder operations," Henderson says.

### BATTLING IRMA

Hurricane Irma, which raced through the Florida peninsula in late August and early September, is a case in point. Palm Coast was hit by winds at 75 to 90 mph and more than 10 inches of rain in two days. About 80 percent of the electric utility customers lost power, including all 156 Palm Coast lift stations.

While the treatment plant itself is built on higher ground and did not flood, the heavy rains and flooding elsewhere produced flows from 10 to 12 mgd, as well as flooding in the collections system. Using an emergency plan it has had in place since the 1990s, the Palm Coast team made it through.

"We usually know about these storms before they hit us," Henderson says. "We have a protocol we go through. Our systems have been able to recover once they pass." The hurricane protocol is detailed and assigns roles to all staff members.

"Prestorm, we get a minimum of two volunteers to stay with the plant from the beginning (sustained winds of at least 35 mph) through the duration of the event," Henderson says. "The A and B shifts for the poststorm period are scheduled with the rally point being the treatment plant. When the storm hits, the operators on duty monitor the SCADA system and, if possible, make corrections to the operation.

"The key is that employees not put themselves in a situation where they can get hurt. They should just monitor and keep track of repairs that will need to be made once the all-clear is given by the emergency management team." Once that happens, calls are placed to all employees letting them know that A shift is starting (12 hours) and B shift should be ready in 12 hours.

"Operators who were on duty during the storm are placed on B shift and relieved from duty and are able to go home and assess their own damage," Henderson says. After the storm, the A shift evaluates the plant and begins making repairs and cleaning up debris. If not all personnel are needed, the extra staff members are assigned to the collections system to help with tank truck pumping, work orders, cleanup or any other needed function.

By this time, all wastewater employees are working 12-hour shifts and continue to do so until all systems are back to normal. "We have a good action plan," Henderson says. "Everyone knows what to do. It's better to be prepared than sorry." **tpo**



Eric Stodola cleans one of four Hydrotech Discfilters (Kruger), used for tertiary treatment to meet the plant's TSS effluent requirements.

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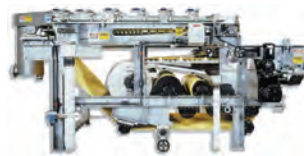
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# Saving Lives, One Paddle Stroke at a Time

GARY AND LINDA DE KOCK PLAN A FOURTH SELF-PROPELLED VOYAGE, THIS TIME DOWN THE MISSOURI RIVER, TO RAISE FUNDS FOR WATER FOR PEOPLE

By Ted J. Rulseh

**G**ary and Linda De Kock have paddled more than 3,800 river miles and raised some \$39,000 for their favorite charity, Water For People. Gary, a former lab chemist and supervisor at the Grand Rapids (Michigan) Water Resource Recovery Facility, adopted the charity as a retirement project. This year, he and Linda plan their most ambitious voyage yet, canoeing all 2,341 miles of the Missouri River.

Their mission is to raise awareness as well as funds for Water For People and its projects that provide water and sanitation service for developing communities in nine countries. Their first three voyages all ended at the home city of the WEFTEC conference — twice in Chicago and once in New Orleans.

First came a 2014 kayak trip down the entire Mississippi River (2,291 miles). Last year, they canoed 1,176 miles on a Five Rivers Voyage on the Wisconsin, Mississippi, Illinois, Des Plaines and Chicago rivers. In between, they paddled 400 miles from Jackson, Michigan, to Chicago.

On their Missouri River Voyage, they aim to raise \$10 per mile, or \$23,410. They'll start in June at Three Forks, Montana, and cross seven states before ending in September at the confluence with the Mississippi just north of St. Louis. The two talked about Water For People and their river adventures in an interview with *Treatment Plant Operator*.

**tpo:** Gary, what is your background in the clean-water profession?

**Gary:** I started in 1982 at the Grand Rapids facility as a chemist. After 11 years, I moved to the Muskegon County (Michigan) Wastewater Management System and was a lab manager there. In 2004, I came back to Grand Rapids and retired in 2013 as operations and maintenance supervisor.

**tpo:** How did you make the connection with Water For People?

**Gary:** At WEFTEC in Chicago years ago, I attended a Water For People event and talked to a number of people who were leaders of the Michigan Water Environment Association. I noticed that while the Michigan Section of the American Water Works Association had a Water For People committee, the Michigan Water Environment Association did not. About 10 years ago, we started a committee to support Water For People, and I've been the chair and co-chair.

**tpo:** What makes you so passionate about Water For People?

**Gary:** In the United States, we're used to having safe and clean water, but people in some countries around the world do not. Water is global, and in communities in developing countries that are struggling, a few dollars can go a long way. It's a lot of bang for the buck.

**tpo:** Have you ever taken part in Water For People projects?

**Gary:** No, but Linda and I have done some traveling in Uganda and Kenya, so we have seen the challenges some communities are facing. We're focusing on activities here that will engage the Water Environment Federation membership, raise money and, we hope, keep sustaining the organization.

**tpo:** Why did you choose paddle voyages? Aren't there easier ways to raise funds?

**Gary:** I'm from Michigan, and everybody here is born canoeing. Furthermore, there is so much competition for people's attention that you have to do something different — you have to go big or go home.

**tpo:** What have you done to generate the attention it takes to raise funds effectively?

**Gary:** Linda shares pictures and stories through our Facebook page. Our Michigan Water Environment

Association committee meets about six times a year, and we talk about what we can do to support next year's voyage. At this year's joint expo with Michigan Section AWWA, we held a silent auction and had a table with information about Water For People. We were the keynote speakers at the Missouri Water Environment Association/Missouri Section AWWA joint conference in March where they have a strong Water For People committee. They did some fundraising, and we talked about plans to paddle the Missouri River through a number of their communities.

**Linda:** We've had coverage on the WEF and Water For People websites. We also hope to connect with other states. We'd like to visit wastewater treatment plants along the Missouri.

**tpo:** How much money have your previous voyages raised?



PHOTO BY JOHN VAN BARRIGER

Gary and Linda De Kock on the Wisconsin River.

**Gary:** We raised nearly \$13,000 for last year's Five Rivers Voyage. Two years ago, we raised about \$9,000 in our paddle from Michigan to Chicago. In 2014, we raised more than \$17,000 on the Mississippi trip. The Missouri trip is more miles and more days than we've done before, and we hope that translates into more dollars, too.

**tpo:** What are some of the hardships of spending so much time on the rivers?

**Linda:** I'm 67, and Gary is 66. You hurt more when you're older, and you don't recover as quickly. That's one of the difficulties. Then, there's getting into the boat in the morning and not knowing where we're going to lay our heads at night. That can be stressful. The size of the trip can get to you. There's wind and rain. We worry about ticks, and the mosquitoes are annoying.

“Water For People is the charity of choice for the WEF, and a lot of our peers support the organization. We believe in it, and we believe in the value of water and the value of community.”

GARY DE KOCK

**tpo:** Have you faced challenges with weather?

**Gary:** Last summer, we had to get off the river a couple of times due to thunderstorms. We can get weather forecasts, so we can tell when weather is coming. If a storm gets too close, that's the time to get off the water and wait for it to pass.

**Linda:** From what we hear about Missouri, the storms really come thundering across the prairies, and they come fast. So we'll be paying attention as closely as we can. We're hoping for a nice, calm summer, but we'll take what we get.

**tpo:** What about dealing with boat and barge traffic on those big rivers?

**Gary:** We travel in shallow water, and the boat traffic tends to be in the deep water. You get used to the barges and how they travel. They tend to be very predictable. We give them lots of room and take our time. We're the smallest thing on the river, so we just assume people don't see us. We stay out of the way and stay in safe areas.

**tpo:** What about the joys of life on the water?

**Linda:** After three or four weeks, you start living on river time. You stop thinking that you have 2,000 miles to go and just think about where you are that day. You become less worried about having to stop because it's raining. You tend to roll with the punches and start experiencing the outdoors in a different way, noticing when the wind changes and when you smell something different. You feel more in touch with Mother Earth.

**tpo:** Is it a solitary life, or are there connections with people along the way?

**Linda:** On every trip, we run into people, total strangers, who walk up and say, "What are you doing?" And their next question is, "What can we do to help?" You don't often see that kind and generous side of people in day-to-day life.

**Gary:** One of the most common things we hear from people is, "What do you need?" Sometimes we don't even have to ask. The next thing we hear after that is, "Be safe."

**tpo:** Have you made any advance connections with people along the Missouri?

**Linda:** As soon as I posted the Missouri trip on our Paddle With Purpose River Voyages Facebook page, I put a link to the Missouri Paddlers page, and within 24 hours, I had a list of eight people along the way who said, "We're here to help." One guy in South Dakota who's with a canoe and kayak club says, "We've got you for the dams in South Dakota." He's saying people

will come with a pickup truck and portage our boat when we get to those dams. Other people say, "We'll have a hot meal waiting for you — just let us know when you get here."

**tpo:** If you were to make a sales pitch for donations to support your Missouri voyage, what would you say?

**Gary:** Water For People is the charity of choice for the WEF, and a lot of our peers support the organization. We believe in it, and we believe in the value of water and the value of community. A small gift can mean a world of difference in communities around the world.

**Linda:** After we did the Mississippi, someone came to the Water For People booth at WEFTEC and said, "You have to realize you're not just raising money — you're saving lives." I think about that a lot when I'm on the water. We don't know exactly what impact we're having, but it's a real privilege to do something meaningful at this point in our lives.

**tpo:** How can your peers in the clean-water profession follow your Missouri voyage?

**Gary:** We'll be carrying our satellite communicator, which will tell every 10 minutes where we are, within 30 feet. People who want to follow that can see us moving down the river. To support our voyage, they can visit the Missouri River Voyage Crowdrise page. To see photos and videos, they can visit Paddle With Purpose River Voyages on Facebook.

**Linda:** They can email us at [gdekock@gmail.com](mailto:gdekock@gmail.com), and we will look for them as we pass by. Tell people we hope to see them on the river! **tpo**

## ABOUT WATER FOR PEOPLE

The beneficiary of the Gary and Linda De Kock paddle voyages was established in 1991 by CH2M's Ken Miller, a former president of the American Water Works Association; Wayne Weiss of Black & Veatch; and John B. Mannion, a former AWWA executive director. They shared a vision of a world where all people have access to safe water and adequate sanitation.

Water For People is an international nonprofit working in Honduras, Guatemala, Nicaragua, Peru, Bolivia, Uganda, Rwanda, Malawi and India. Recognizing that 2.1 billion people around the world lack access to safe water, the charity promotes the development of high-quality drinking water and sanitation services.

Its projects include not only building wells, installing toilets, and setting up pumps, but also supporting long-term, sustainable change by learning what community members, governments, and business owners need to feel healthy, safe, and empowered, and then building capacity to change entire systems so that water and sanitation services will last for generations.

Water For People has strong partnerships with AWWA, the Water Environment Federation, the Water Quality Association, the National Association of Water Companies, the National Association of Clean Water Agencies, and the Association of Metropolitan Water Agencies.

In recognition of the De Kocks' contributions, they received two honors at WEFTEC 2017: They received the Robert W. Hite Outstanding Leadership Award given by Water For People as well as the WEF President's Recognition from President Rick Warner, a Water For People supporter.



The solar array includes 3,312 panels and occupies 5 acres. AEP OnSite Partners maintains the area around the panels.

# From Brown to Green

A SOLAR ARRAY HELPS AN OHIO CITY POWER ITS WASTEWATER TREATMENT PLANT, LOCK IN ELECTRICITY SAVINGS, AND RESTORE A BROWNFIELD SITE TO PRODUCTIVE USE

By Steve Lund

The wastewater treatment plant in the Ohio city of Newark played a key role in putting a contaminated former industrial site to use.

Once home to an aluminum processing plant, the site was subject to severe restrictions, even after remediation. Eventually, American Electric Power (AEP) OnSite Partners and the city collaborated to give the brownfield a new purpose.

AEP developed a 1 MW solar array, and the city signed a long-term agreement to use the power at its wastewater treatment plant nearby. While such solar installations are not unusual, this case presented unique challenges. The 66-acre site had been covered with mounds of aluminum dross, the waste product from Newark Processing, which had operated dry mills, wet mills and furnaces. The company went bankrupt in 1997.

## REMEDIATION PLANS

In 2005, a plan was drawn up to stabilize the severely eroding banks of the Licking River at the site. The Army Corps of Engineers completed the work in 2009 with a \$2.8 million grant from the Ohio Environmental Protection Agency. For the rest of the remediation, Newark received a \$2 million Clean Ohio Revitalization Fund grant.

“The Army Corps of Engineers graded everything basically level,” says Mark Mauter, the city’s development director. The riverbanks had been covered with large rocks to prevent erosion, and the area where aluminum was processed and waste product stored was covered with a geotextile fabric, which was then capped with soil and planted with vegetation. “We trucked in enough subsoil to cover 40 acres with 2 feet of soil,” Mauter says.

## LIMITED OPTIONS

At that point, the city had a cleaned-up brownfield that looked like green space, but there were few development options. “We are not allowed to penetrate that cap, even with something like tree roots,” Mauter says.

“When we knew we weren’t able to put any kind of structure there, we started talking about a solar array. We thought that with the wastewater treatment plant only a 1/2 mile away and with that plant being the city’s biggest electricity user, maybe something could work out.”

But even the idea faced problems. For one, the city didn’t want to own and operate a solar power system. For another, solar panels need support structures. The only way to support the array would be to use concrete anchors on the surface. Nothing happened right away. “We had companies approaching us, but they wanted us to own and maintain it,” Mauter says.

Waiting ultimately worked. In 2015, AEP OnSite Partners offered to build, own, and maintain a solar array; the city would just have to buy the power.

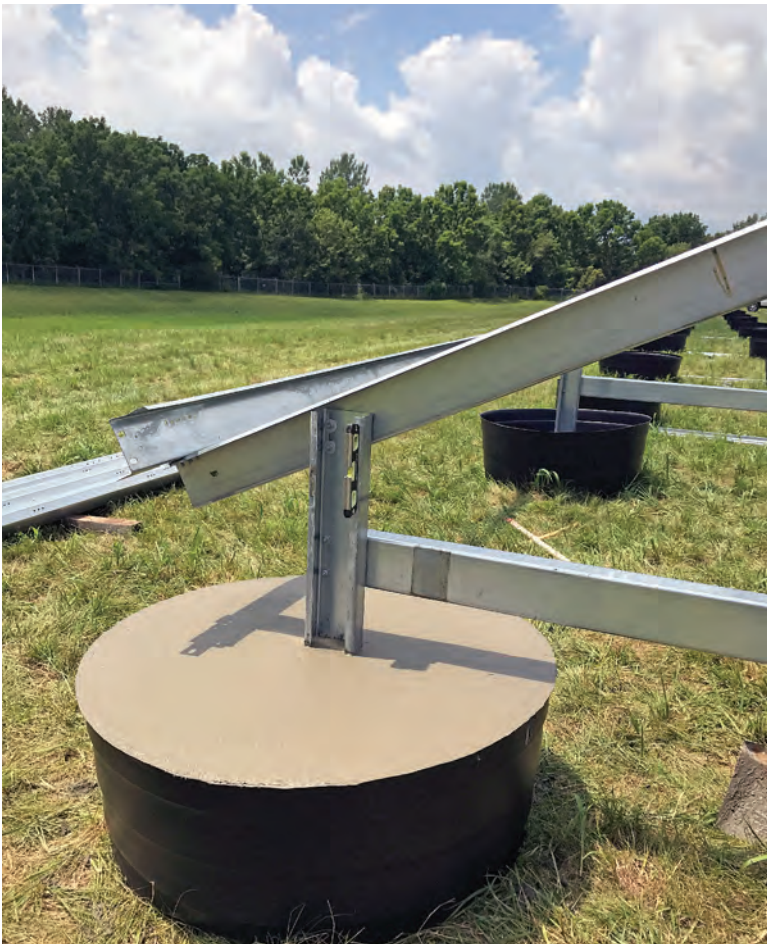
“It’s hedging against future increases in electric rates. We have a 25-year agreement at a rate fairly close to what we pay right now. We took a little bit of a gamble that electricity prices will continue to go up.”

**BRYAN CURRY**

## CONCRETE POURED

The supports for the solar panels are anchored by concrete disks about 3 feet in diameter and 18 to 24 inches high, poured in place. AEP has used similar ballasted systems before, but the Newark project was different.

“The concrete tub structure used in Newark is a newer type of ballasted system versus what we have used before,” says Tammy Ridout, manager of media relations for AEP. “There is a slight increase in the cost, but we found it to be cost-effective because there are other efficiencies. For example, it is safer and more efficient for workers to pour concrete into a tub than to move large concrete blocks into place.”



The supports for the solar panels are anchored by concrete disks, poured in place, so that the cap on the brownfield site did not need to be penetrated.

The 3,312-panel system occupies 5 acres. Although AEP OnSite Partners maintains the area around the panels, Newark must provide reports to the Ohio EPA twice a year to show that there is adequate vegetation on the site's total 40 acres to prevent erosion.

### POWER TO THE GRID

The solar array will produce 25 to 30 percent of the plant's electricity and, at times, it will produce more than the plant can use. For example, on one sunny day last fall, the solar array was producing 780 kW, while the plant was using 450 kW. "Our whole plant was running entirely off the solar array for about six hours," says Bryan Curry, plant superintendent. Because the plant has net metering, excess power can be sold to the utility grid.

In the past, plant operators had considered generating electricity from biogas, but the economics never worked out. The 8 mgd (design) has three anaerobic digesters (Walker Process Equipment, A Div. of McNish Corp.). The methane is scrubbed in a pressure swing adsorption unit (Guild Associates) made and sold to the local gas company.

### LONG-TERM SAVINGS

Curry believes the solar project will work out well economically. The price for electricity coming off the solar array is comparable to the local utility rate, but there could be significant savings over time. "It's hedging against future increases in electric rates," Curry says. "We have a 25-year agreement at a rate fairly close to what we pay right now. We took a little bit of a gamble that electricity prices will continue to go up.

"I'm hoping that each month we'll have some savings. As utility prices go up faster than the price for solar, we'll be saving more and more every year. It's not a huge savings, but the use of the brownfield really makes it nice." **tpo**



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Odor Control*

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# Biosolids Management and Headworks

By Craig Mandli

## Belt Filter/Rotary Presses

### BRIGHT TECHNOLOGIES, DIVISION OF SEBRIGHT PRODUCTS INC., BELT FILTER PRESS

The compact, 0.6-meter skid-mounted belt filter press from Bright Technologies, Division of Sebright Products Inc., has stainless steel frame and roller construction, and radius wedge zone and wing roller for sludge dewatering. Components include a sludge pump, polymer system and wash-water booster pump. Options include a sludge flowmeter, air compressor and discharge conveyors. The compact walkaround skid design can be utilized in as little as a 20-by-10-foot floor area. The Boerger rotary lobe sludge pump has a maintain-in-place design offering ease of maintenance. A Gould's belt wash booster pump can handle small solids and operate with recycled water from the process. Allen-Bradley controls and touch screen integrate the components to make an operator-friendly design that is intuitive to operate. Cake solids of up to 35 percent can be achieved. Rates of 25 to 50 gpm (depending on biosolids type) make this ideal for small applications or when a processor has outgrown dewatering containers. **800-253-0532; www.brightbeltpress.com**



Belt filter press from Bright Technologies, Division of Sebright Products Inc.



Rotary press from Fournier Industries

### FOURNIER INDUSTRIES ROTARY PRESS

The rotary press from Fournier Industries uses two slowly rotating screens to create a 2-inch-wide channel that the sludge passes through as it dewateres. A pressure restrictor on the outlet of the press allows

the operator to vary the degree of cake dryness in the final product. The unit has very few com-

ponents and is designed for ease of maintenance and unattended operation. The totally enclosed design mitigates odors and allows the operator to avoid direct contact with the sludge. It can be equipped with a single dewatering channel or can be expanded up to eight channels on a single machine. Septage can be treated to a cake dryness in the more than 30 percent range. **418-423-4241; www.rotary-press.com**

### JWC ENVIRONMENTAL MONSTER WASH PRESS

The Monster Wash Press from JWC Environmental cleans and compacts the discharge from headworks screens, separating water and organics from the solids. Its Muffin Monster grinder preconditions screenings before entering the press. The grinder breaks open rags, plastics, and trash to promote washing and removal of soft organics. The rotor paddle in the wash zone agitates the material to enhance water penetration



Monster Wash Press from JWC Environmental

throughout the debris for even better removal of the organics from the solids. Organics are washed back into the wastewater treatment process, and the solids are compacted into a dry, less-odorous solid plug. The press is designed for easy maintenance. The rotor and field-replaceable screen can be removed via the top of the unit, minimizing the clearance space needed around the unit during maintenance. A grinderless version is available. **800-331-2277; www.jwce.com**

### SCHWING BIOSET DEWATERING SCREW PRESS

The dewatering screw press from Schwing Bioset is available in a wide range of model sizes. System highlights include automated control allowing for unattended operations, long life span due to slow speeds and robust construction, stainless steel wetted parts, screen casing that is split to simplify screw removal, perforated screen allowing for tight tolerances and improved performance over wedge-wire screens, and low wash-water requirements. Dewatering results are similar to high-speed centrifuges. **715-247-3433; www.schwingbioset.com**



Dewatering screw press from Schwing Bioset

## Biosolids Handling/Hauling/Disposal/Application



BLUEline Rotary Lobe Pump from Boerger

### BOERGER BLUELINE ROTARY LOBE PUMP

The BLUEline Rotary Lobe Pump from Boerger is a self-priming, valveless, positive displacement pump used for the conveyance of viscous and abrasive materials. There are 21 pump models in six series with pulsation-free operation, fully reversible rotation, dry-run capabilities and flow rates up to 7,500 gpm. The pumps are stable and wear-resistant with a maintenance-in-place design that allows for all wetted parts to be easily replaced through the front cover without the removal of pipe or drive systems. **612-435-7300; www.boerger.com**

### JDV EQUIPMENT LEVEL LODOR

The Level Lodor cover system from JDV Equipment helps contain odors by covering standard dump containers used for hauling processed material. The design allows for even distribution, increasing the fill percentage without having to manually even out material. Enclosing containers allow outdoor installation without exposing material to the environment or pests. **973-366-6556; www.jdvequipment.com**



Level Lodor cover system from JDV Equipment

### KUHN NORTH AMERICA KNIGHT PROTWIN SLINGER SLC 132

The 3,200-gallon Knight ProTwin Slinger SLC 132 truck-mounted, side-discharge spreader from Kuhn North America maximizes produc-





**Knight ProTwin Slinger SLC 132 spreader from Kuhn North America**

tivity and performance. A truck-mounted machine provides fast, convenient travel for longer hauls. With the free-swinging hammer discharge, each forged steel hammer swings down into the material, peeling it off, pulverizing and slinging it underhand for an even spread. The easily adjustable hydraulic deflector

provides complete control of the discharge pattern from 3 to 50 feet to fit any application. An optional scale system allows easy monitoring and documentation of spreading activity. Its low-discharge pan not only helps prevent spilling material on roadways, but also hides material from public view. **800-544-9710; www.kuhnnorthamerica.com**

## LYSTEK INTERNATIONAL THERMAL HYDROLYSIS SYSTEM

The thermal hydrolysis system from Lystek International reduces costs, volumes, and greenhouse gases by converting municipal and industrial wastewater treatment facilities into resource-recovery centers. This is achieved by transforming organic waste streams into value-added products and services, such as the LysteMize process for optimizing digester performance, reducing volumes, and increasing biogas production; LysteGro, a high-value, nutrient-rich biofertilizer; and LysteCarb, an alternative source of carbon for BNR systems. **888-501-6508; www.lystek.com**



**Thermal hydrolysis system from Lystek International**



**Longifill continuous bag system from Paxxo**

## PAXXO LONGIFILL

The Longifill continuous bag system from Paxxo can connect to the discharge point of machines used to move, dewater, or compact screenings, grit, and biosolids. Material is then deposited in a 295-foot-long continuous bag for odor containment and spillage control. The cassette bag is easy to seal, and the material and odors are trapped inside, cutting down development of bacteria and fungus spores. **770-502-0055; www.paxxo.com**

## Biosolids Heaters/Dryers/Thickeners

### VEOLIA WATER SOLUTIONS & TECHNOLOGIES NORTH AMERICA ROTARY DRUM THICKENER

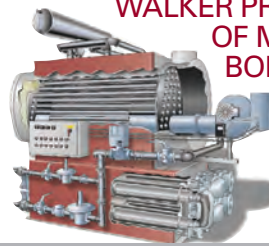
The rotary drum thickener from Veolia Water Solutions & Technologies North America consists of an enclosed cabinet in which a drum is suspended and rotates by means of an adjustable gear motor. The drum is built of a skeleton onto which windings have been welded, and a filter cloth made of polyester is fastened around the skeleton. The nozzles for cleaning of the filter cloth are installed on a pipe that, without use of tools, can be taken out for inspection and cleaning while wash water can be used for cleaning of the drum. It can be used for concentration of sludge before digesters, for replacement of concentration tanks for both primary and biological



**Rotary drum thickener from Veolia Water Solutions & Technologies North America**

sludge, for an increase of the dry-solids capacity at the final dewatering plant, or as the sole thickener at plants where a high-dry solids content is not required. **919-677-8310; www.veoliawatertech.com**

### WALKER PROCESS EQUIPMENT, A DIV. OF MCNISH CORP., COMBINATION BOILER/HEAT EXCHANGER



**Combination boiler/heat exchanger from Walker Process Equipment, A Div. of McNish Corp.**

The combination boiler/heat exchanger from Walker Process Equipment, A Div. of McNish Corp., is a tube-in-tube-type heat exchanger on a common base with a hot water boiler. The boiler and exchanger are integrated with water piping, fuel lines, instrumentation and

a complete electrical control system. Controls include modulating fuel control technology. The boiler is a dry-back, double-pass boiler heated with a forced draft burner for maximum combustion efficiency and operating dependability. The exchanger is an independent tube-in-tube design with a biosolids/water counterflow arrangement that provides maximum heat transfer for a compact heating system. The boiler maintains an inventory of water at a relatively high temperature, typically 180 degrees F, that assures optimal boiler exhaust temperature that helps prevent flue condensation. The heat-exchanger-fed water system automatically blends hot water with warm water exiting the heat exchanger on demand to maintain an optimal heat transfer. **630-892-7921; www.walker-process.com**

## Chemical/Polymer Feeding Equipment



**ADIN CO2 injection system from AdEdge Water Technologies**

### AEDGE WATER TECHNOLOGIES ADIN CO2

The ADIN CO2 injection system from AdEdge Water Technologies is an alternative to other methods of alkalinity control and pH reduction. It's ideal for the reduction of alkalinity prior to primary treatment components for optimizing contaminant removal. The system uses carbon dioxide gas, which when released

in water, forms carbonic acid — a weak acid that immediately reacts with alkalis to reduce pH. As a gas, carbon dioxide is inert, noncorrosive and easy to store. With the use of the included monitoring equipment and injector, the control panel can be used in several different configurations to reduce pH. The automatic systems use a pH probe downstream of the system to regulate the amount of carbon dioxide being injected into the water. An injector and mixer are provided with all systems for optimal injection. A manifold and regulators are provided for carbon dioxide cylinders. **866-323-3343; www.adedgetechnologies.com**

### FORCE FLOW CHLOR-SCALE AND HALOGEN ECLIPSE

To protect chlorination systems from dangerous leaks, the Halogen Eclipse emergency valve shut-off system instantly closes the container valve when a signal is received from a leak detector, panic button or SCADA. The



**Halogen Eclipse and Chlor-Scale from Force Flow**

actuator quickly installs on the tank without the use of any tools and allows manual operation of the valve while in place. During an emergency shutdown event, the system measures the actual torque applied to the valve to ensure that the valve is closed to Chlorine Institute recommended standards and provides remote confirmation that the emergency close operation successfully closed the valve. The Chlor-Scale from Force Flow safely cradles a chlorine ton container while providing critical feed and chemical inventory information. Know in real time exactly how much chlorine has been fed and how much remains in the tank. It can warn of excessive or insufficient feed rates and can be remotely monitored from a PLC or SCADA system. **800-893-6723; www.forceflow.com**



**PEABODY ENGINEERING & SUPPLY  
GEMINI2 MCU**

The Gemini2 MCU from Peabody Engineering & Supply is a dependable solution for small chemical feed applications. It allows users to store multiple chemicals in a single, multicompartiment dual-containment tank, enabling users to configure two, three, or even four liquids in one compact space with separate containment. The dual-containment system simplifies feed systems when having to feed multiple chemicals with limited storage or usage space. It is customizable with individual modules of

**Gemini2 MCU from Peabody Engineering & Supply**

6- and 12-gallon sizes and three different assembly configurations. All units have a finished size of 25 by 26.75 inches, making them ideal for compact spaces. Options include the PumpDeck to manage spills, and a leak alarm. **800-473-2263; www.4peabody.com**

**PROMINENT FLUID CONTROLS  
PROMIX-L**

The ProMix-L from ProMinent Fluid Controls is a complete pre-engineered polymer mixing system with intuitive controls. Designed as an in-line or makedown unit, the system is engineered to meet liquid polymer applications using gear or progressing cavity pump technologies. The mixing regime delivers a highly activated polymer solution to every application with optimum performance. **412-787-2484; www.prominent.us**



**ProMix-L mixing system from ProMinent Fluid Controls**

**SEPEX BRAVO CHEMICAL  
METERING SYSTEM**

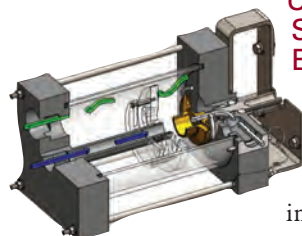
BRAVO chemical metering systems from SEPEX are plug-and-play, pre-engineered feed systems that improve process control with accurate and repeatable flows and lower chemical consumption. The system is an integrated, modular, and scalable solution used for disinfection, pH control, flocculation, corrosion inhibition, oxygen scavenging, and



**BRAVO chemical metering systems from SEPEX**

contaminant elimination. It is designed as single source for pumps and controls. Systems are built from standardized panels in floor- or wall-mounted simplex, duplex or triplex options. The system incorporates NSF/ANSI 61 certified SEPEX progressive cavity Intelligent Metering Pumps. Slip is minimized even when fluid temperature, viscosity, or discharge pressure fluctuates. **937-864-7150; www.seepex.com**

**UGSI CHEMICAL FEED A UGSI SOLUTIONS COMPANY POLY-BLEND MAGNUM MIX CHAMBER**



**PolyBlend MAGNUM polymer activation system from UGSI Chemical Feed a UGSI Solutions Company**

The PolyBlend MAGNUM mix chamber polymer activation system from UGSI Chemical Feed a UGSI Solutions Company includes an expanded low-energy mix zone that increases polymer residence time and accelerates hydration/relaxation of the activated polymer chains, resulting in increased viscosity and performance. Testing has demonstrated polymer savings of up to 30 percent. The design includes direct coupling of the motor, eliminating the need for shaft alignment, and also a quick-disconnect check valve, eliminating the need for tools and time for periodic cleaning. Complete new units and field retrofit chamber kits are available. **855-669-3845; www.ugsichemicalfeed.com**

ates hydration/relaxation of the activated polymer chains, resulting in increased viscosity and performance. Testing has dem-

onstrated polymer savings of up to 30 percent. The design includes direct coupling of the motor, eliminating the need for shaft alignment, and also a quick-disconnect check valve, eliminating the need for tools and time for periodic cleaning. Complete new units and field retrofit chamber kits are available. **855-669-3845; www.ugsichemicalfeed.com**

**Composting Equipment**

**ROTO-MIX INDUSTRIAL COMPOST SERIES**

Roto-Mix Industrial Compost Series mixers come with a GeneRation II Staggered Rotor, a rotary design that combines gentle tumbling with quick, complete mixing to ensure rapid decomposition and quality compost. Ingredients are lifted up to the side augers that move the material end to end for a fast, thorough mix. Total movement of material in the mixing chamber eliminates dead spots. The rotor lifts the material past the wedging point of the lower side auger, providing a fluffier mixture while lowering power requirements. A conveyor is used to build windrows or static piles. Mixers are available in 16.7-, 23-, 27.8- and 34.1-cubic-yard capacities as stationary, trailer or truck-mount units. **620-338-0090; www.rotomix.com**



**Industrial Compost Series mixers from Roto-Mix**

**Dewatering Equipment**

**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 percent solids in 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 percent with reductions to 98 percent 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**



**ADS dewatering unit from AQUA-Zyme Disposal Systems**



Dewatering system from In The Round Dewatering

## IN THE ROUND DEWATERING HORIZONTAL DRUM

The horizontal biosolids dewatering system from In The Round Dewatering has a stainless steel drum with perforated plastic tile lining. The drum is mounted on a roll-off frame for easy transport and unloading. Water trays allow contain-

ment of discharge water. An 18,000- to 25,000-gallon batch is mixed with polymer before being filtered in the rotating drum, driven by a 1/2 hp variable-speed electric motor with a heavy-duty chain and sprocket. The turning eliminates crusting and wet pockets to produce uniform, consistent results. The dewatered material dumps easily, and the drum is self-cleaning. **317-539-7304; www.itrdewatering.com**

## Grinders/Shredders

### HYDRA-TECH PUMPS S3SHR

The S3SHR 3-inch hydraulic-drive submersible shredder pump from Hydra-Tech Pumps continuously rips and shears solids with 360-degree shredding action. It uses an open-vane shredder impeller with tungsten carbide cutting tip. Compact size allows it to fit in tight spaces. A guide rail assembly is available for stationary applications. Combined with HT11 to HT20 power units, it handles flows up to 450 gpm. The safe and variable-speed hydraulic drive can be used where electric power is hazardous or impractical. **570-645-3779; www.hydra-tech.com**



S3SHR shredder pump from Hydra-Tech Pumps



EZstrip TR Muncher from NOV

### NOV EZSTRIP MUNCHER

To minimize the time and cost involved when maintaining a conventional grinder/macerator, the EZstrip TR Muncher from NOV can be maintained in place without disconnecting or removing any pipework. The complete cutter stack can be inspected and replaced within 2 1/2 hours. Cutter materials and thickness options are available for effective and efficient grinding of solids. The lower cutter-tip speeds dramatically reduce wear rate and ensure low noise and vibration as well as good abrasion resistance. The rotational speed produces high torque, resulting in lower operating power at 1.5 or 2.2 kW, which are available with energy-efficient motors. **832-424-7300; www.nov.com/industrial**

## Headworks

### FLUIDYNE SURGE ANOXIC MIX (SAM)

The SAM biological wastewater treatment process from Fluidyne provides high effluent quality while handling variable flows and loadings without the need for final clarifiers or RAS pumping and piping. The process includes built-in flow equalization to buffer peak and organic loading while also incorporating anoxic and aerobic zones for energy efficient BOD, TSS and nutrient removal. The system eliminates the need for the influent control valves associated



SAM biological wastewater treatment process from Fluidyne

with conventional SBRs while providing quiescent settling and decanting that is not possible with continuous-fill batch processes. It requires a small footprint and allows the ability to take an SBR offline while providing full treatment. It can handle flows from as low as 10,000 gpd up to 20 mgd. Pre-engineered package plants are available for smaller flows. **319-266-9967; www.fluidynecorp.com**



PROflex reverse osmosis system from SUEZ Water Technologies & Solutions

### SUEZ – WATER TECHNOLOGIES & SOLUTIONS PROFLEX

The PROflex reverse osmosis system from SUEZ is configurable using the company's online product configurator, which allows customers to select the exact flow rate required

from a range of systems. It is a fit for a variety of applications, including general industrial, power, drinking water, food and beverage, mining, refining and petrochemical industries. The most frequently requested features are available now as prepriced options. SUEZ has minimized the overall footprint to use less space and moved key components to the front of the unit for more accessibility. **www.suezwatertechnologies.com**

### KSB AMAPROP 1000

Midsized Amaprop 1000 hybrid mixers from KSB can serve as part of an optimized mixing procedure that can reduce operational energy needs, increasing energy output and revenues for the plant. They are optimized for each mixing task to ensure a specific flow volume and that they deliver enough thrust to move the medium through all sections of the fermenting tank. Use of multiple, properly positioned mixing units — each of which processes the reduced, diluted material created by other units — can help prevent short-circuiting flow paths and support the best possible transformation process. They combine all the benefits of an agitator with the turbulence generation of a traditional mixer. If substrate viscosity increases, they can adjust the conveying action to offset the increase and maintain optimal flow. **804-222-1818; www.ksbusa.com**



Amaprop 1000 hybrid mixers from KSB

### 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



VortaFlo static mixer from Park Process

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**

(continued)

### VAUGHAN CONDITIONING PUMP

The Vaughan conditioning pump is a Vaughan submersible chopper pump mounted on a portable stand that's fitted with a high-velocity mixing nozzle. The unit recirculates the contents of the wet well, chopping and mixing to produce a homogeneous mixture that is more easily pumped out. Floating mats are removed, and solids accumulated on the floor are resuspended. The pump is mounted on a portable stand, easily used in multiple applications at a single job site, facility or municipality. **888-249-2467; www.chopperpumps.com**



Conditioning pump from Vaughan

## Septage Receiving Stations

### LAKESIDE EQUIPMENT RAPTOR SEPTAGE COMPLETE PLANT



Raptor Septage Complete Plant from Lakeside Equipment

The Lakeside Equipment Raptor Septage Complete Plant is used to manage the unloading process and protect downstream equipment. The septage receiving system with security access and hauler management and accounting software provides municipalities with the tools needed to maximize revenue generation and produce more energy with a minimum of maintenance. **630-837-5640; www.lakeside-equipment.com**

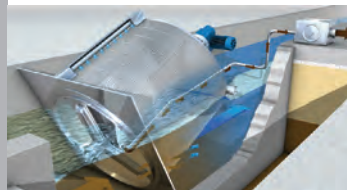
### SCREENCO SYSTEMS MEGA SCREEN

The Mega Screen receiving station from ScreenCo Systems has 40.5 square feet of screening area and is fed through a 6-inch inlet with dual

fan spreaders. The front screens are self-cleaning, processing up to 1,000 gpm. The dual screen design is non-mechanical and uses gravity to separate trash from the waste stream. The unit is constructed from aluminum and utilizes stainless steel 3/8-inch gapped bar screens at opposing angles, meeting the 503 regulations for septic screening. It can be set up with a single 6-inch inlet hose or two 4-inch inlet hoses capable of off-loading two trucks simultaneously. It will not plug with rags or hair, and simple raking to the trash drain tray with provided custom tools makes clean-out simple. Built-in forklift skids make it portable. An OSHA-compliant catwalk is included. **208-790-8770; www.screencosystems.com**

Mega Screen receiving station from ScreenCo Systems

## Screening Systems



Rotamat RPPS STAR from Huber Technology

### HUBER TECHNOLOGY ROTAMAT RPPS STAR

The Rotamat RPPS STAR from Huber Technology addresses increased equipment protection requirements with a 1- or 2-mm pleated perforated plate geometry that significantly increases throughput and allows for a smaller footprint. This results in a reduced capital expenditure for the screen and structure. The fold provides additional stiffness critical to larger drum designs. **704-949-1010; www.huberforum.net**

### KUSTERS WATER, DIVISION OF KUSTERS ZIMA CORP., PROTECTOR CENTERFLOW BAND SCREEN

The Kusters Water, division of Kusters Zima Corp., ProTechtor Centerflow Band Screen, with its vertical orientation, is an ideal choice for headworks applications with limited footprint and headspace. Influent enters the middle of the screen and then passes through the traveling perforated plate filter belt out the side and bottom, eliminating all bypass and resulting in improved effluent quality and higher capture rates. **864-576-0660; www.kusterswater.com**



ProTechtor Centerflow Band Screen from Kusters Water, division of Kusters Zima Corp.



Aqua Caiman rake screen from Parkson

### PARKSON AQUA CAIMAN

The Aqua Caiman in-channel articulating rake screen from Parkson provides durability, ease of operation, and protection of downstream process equipment. The system's flexible belt assembly handles large solids and eliminates the need for bottom bearings. Teardrop-shaped bars are designed for low headloss. Full rake engagement is achieved with the True-Engage bar fastening design. The True-Track chain positioner allows for rake engagement adjustment without a hoist. It is designed to fit various applications and is ideal for plants seeking low-maintenance screening. It can be used in conjunction with Parkson's conveyors or wash compactors to complete the screening system. **888-727-5766; www.parkson.com tpo**

**“My job depends on surrounding myself with good people in the organization. There are many who play different roles and who make everything come together. They allow me to succeed along with them.”**

Donald Malovets  
Regional Maintenance Superintendent  
Brazos River Authority  
Waco, Texas

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# CONTROL FOG, ODOR AND CORROSION

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Anue Water Technologies, a leader in highly-effective and sustainable engineered technologies, offers proprietary technology for controlling odor, corrosion and FOG. The design features ease of operation coupled with full telemetry capabilities for remote programming and control. The integrated ozone and oxygen generation systems are proven solutions for point source odor and force main corrosion control. ANUE's proprietary solutions provide safe, non-hazardous, and cost-effective methods for the elimination and prevention of FOG, odor and corrosion. ANUE's systems are used successfully by municipalities across North America as well as several countries worldwide.



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**For FREE information on these biosolids management and headworks products, check the box(es) below:**

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- Bright Technologies, Division of Sebright Products Inc., belt filter press
- Fournier Industries rotary press
- JWC Environmental Monster Wash Press
- Schwing Bioset dewatering screw press

#### Biosolids Handling/Hauling/Disposal/Application

- Boerger BLUEline Rotary Lobe Pump
- JDV Equipment Level Lodor cover system
- Kuhn North America Knight ProTwin Slinger SLC 132 spreader
- Lystek International thermal hydrolysis system
- Paxxo Longofill continuous bag system

#### Biosolids Heaters/Dryers/Thickeners

- Veolia Water Solutions & Technologies North America rotary drum thickener
- Walker Process Equipment, A Div. of McNish Corp., combination boiler/heat exchanger

#### Chemical/Polymer Feeding Equipment

- AdEdge Water Technologies ADIN CO2 injection system
- Force Flow Halogen Eclipse and Chlor-Scale
- Peabody Engineering & Supply Gemini2 MCU
- ProMinent Fluid Controls ProMix-L mixing system
- SEEPEX BRAVO chemical metering system
- UGSI Chemical Feed a UGSI Solutions Company PolyBlend MAGNUM polymer activation system

#### Composting Equipment

- Roto-Mix Industrial Compost Series mixers

#### Dewatering Equipment

- AQUA-Zyme Disposal Systems ADS dewatering unit
- In The Round Dewatering dewatering system

#### Grinders/Shredders

- Hydra-Tech Pumps S3SHR shredder pump
- NOV EZstrip TR Muncher

#### Headworks

- Fluidyne SAM biological wastewater treatment process
- SUEZ – Water Technologies & Solutions PROflex reverse osmosis system
- KSB Amaprop 1000 hybrid mixers
- Park Process VortaFlo static mixer
- Vaughan conditioning pump

#### Septage Receiving Stations

- Lakeside Equipment Raptor Septage Complete Plant
- ScreenCo Systems Mega Screen receiving station

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TPO0218

By Craig Mandli

## City looks to oxygen for odor control

### Problem

The city of Chestermere, Alberta, relies on Calgary municipal wastewater treatment plants. That requires extended force main for delivery. City leaders were concerned with odor control as Calgary maintained a hydrogen sulfide limit of 5 ppm at the monitoring station just upstream of its plants. The existing chemical odor-control program was expensive and required supply tanks and frequent truck deliveries, which sometimes bothered neighborhood residents. Untreated hydrogen sulfide levels exceed 300 ppm.

### Solution

**Anue Water Technologies** provided a demonstration trailer in a successful pilot test of **oxygen treatment**. It eliminated the odors and involved no storage or delivery of chemicals. The pilot enabled the city to try out the oxygen-generation equipment, the effectiveness of oxygen infusion, and the software for on-site and remote monitoring and control while also validating the odor control solution on a full-flow force main test.



#### RESULT

The city purchased a permanent system after the demonstration project for installation in summer 2018. **760-727-2683; www.anuewater.com**

## Metering pump resolves plant maintenance issues

### Problem

West Valley Water District, serving 80,000 customers in Riverside County, California, was using a single diaphragm pump to inject 12.5 percent sodium hypochlorite to treat drinking water at two wells. During the suction phase, vapor lock caused loss of prime once or twice a month on average, requiring an operator to travel to the well site and manually relieve the pressure.

### Solution

The district replaced the single diaphragm pumps with **Blue-White Industries' Pro-Series-M MD-3** double diaphragm metering pumps. When the first diaphragm is in the suction phase, the second diaphragm is in the discharge phase. This allows fluid flow to occur almost continuously, preventing gas buildup and loss of prime.



#### RESULT

The pumps have experienced no loss of prime since installation in 2016. "The pumps have not been serviced since they were installed," says Tony Lopez, production operator. **714-893-8529; www.blue-white.com**

## Continuously cleaned bar screen solves ragging downstream

### Problem

The perforated fine screen at the Bell County Water Control & Improvement District South Wastewater Treatment Plant in Killeen, Texas, was inadequate and needed excessive maintenance. Grease and rags that were passing through clogged the aeration basin and settled in the diffuser, even blocking valves. At the headworks, the screen "moved debris around — back and forth — rather than removing it," says Bruce Sorenson, chief operator. The screen often overflowed at high flows.

### Solution

Plant leadership chose **Duperon's FlexRake FPFS-M** screen with 1/8-inch openings. It captures up to 37 percent more debris than 1/4-inch screening.



#### RESULT

"We could see the difference right at startup," Sorenson says. "The back side of the screen cleared up immediately; we could always see debris coming through before, but since the FlexRake was installed, we haven't seen anything. It really catches everything." Cleaning and maintenance downstream have been reduced. **800-383-8479; www.duperon.com**

## Centrifuge helps district produce dryer solids and reduce polymer consumption

### Problem

West Central Conservancy District in Avon, Indiana, had a belt press to dewater biosolids, but the system required a lot of man hours for maintenance and cleanup, and also used a high amount of polymer (4.5 to 5 gph at \$16 per gallon) and had cake solids of only 12 to 14 percent.

### Solution

The district installed a **centrifuge system** from **Flottweg Separation Technology**. The system automates feed pumps, grinders, polymer systems, conveyers and slide gates. The operator can easily control all of the equipment from one simple-to-use control panel. The centrifuges were also installed with Recuvanes, which recovers the centrifugal energy of the liquid phase and reduces power consumption.



#### RESULT

The system saved the city money by producing much dryer solids (18 to 21 percent), significantly reducing disposal costs. It also saved on energy and maintenance. Polymer consumption was cut to 1.25 to 1.75 gph, saving \$44 per hour on polymer, which is over \$90,000 per year based on 40 weeks of operation. **859-448-2331; www.flottweg.com**

## Grit removal technology upgraded during expansion

### Problem

During a 2016 expansion, management at the Elkhart (Indiana) Wastewater Treatment Plant decided to replace outdated grit basins to improve efficiency and capacity.

### Solution

The city chose **PISTA VIO grit removal systems** from **Smith & Loveless**. Chambers were installed inside existing aerated grit basins, increasing flows up to 40 mgd. Chamber internals are made of 304 stainless steel, preconstructed, and shipped complete with total grit handling equipment including pumping, conveying, concentration, and PLC controls. A circular forced vortex grit chamber allows design of the inlet and outlet channels at any variable angle up to 360 degrees, saves space. The system's baffle system promotes a hydraulic vortex flow path that provides 95 percent grit removal efficiency across all flows for particles down to 100 microns.



### RESULT

Use of the existing channels minimized new construction and concrete costs. Testing revealed that the systems removed 99 percent of grit down to 100 microns across all flows. 800-898-9122; [www.smithandloveless.com](http://www.smithandloveless.com)

## City ends permit limit infringements with additive

### Problem

The Southside Wastewater Treatment Plant in Tyler, Texas — a multi-train activated sludge plant — had seen sporadic effluent quality because of aeration limitations, compounded by low and unstable pH and insufficient influent alkalinity. The city's recently commissioned water plant occasionally sent low-pH solids and process water to the facility. This led to intermittent permit limit infringement and potential for violations. Caustic soda was used to supply alkalinity and raise the pH, but great care was required to prevent pH spiking, and the amount of alkalinity supplied under the spiking limitations was marginal.

### Solution

The city chose **Thioguard Total System Treatment**, a nonhazardous, nonpharmaceutical, technical-grade milk of magnesia to supply significantly more alkalinity in a biologically reactive form while shifting the pH into a bio-optimal range. The product also added divalent cations, improving the M/D ratio.



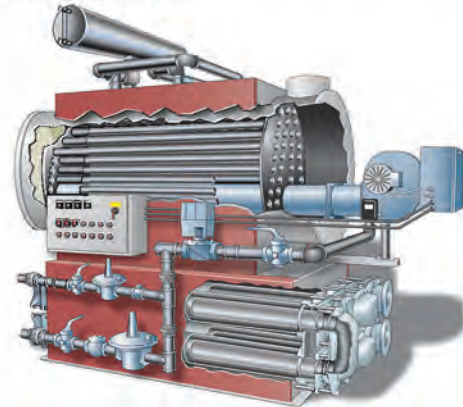
### RESULT

Once on Thioguard and through a fully activated sludge age cycle, effluent BOD, TSS, and NH<sub>3</sub> numbers dropped to well below permit limits and remained level. The city has used the product continuously ever since, withstanding random influent quality swings and aeration system upsets. 800-227-4287; [www.thioguard.com](http://www.thioguard.com)



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FREE INFO — SEE ADVERTISER INDEX

## Dewatering press allows industrial plant to meet concentration goal

### Problem

The operators at a Wisconsin-based wastewater treatment facility for a cheese and yogurt plant had used a rotary-style press for dewatering. Anaerobic sludge at 1.9 to 3.4 percent solids was processed at 45 to 80 gpm. The existing dewatering equipment had difficulty achieving the desired 10 percent solids cake and filtrate quality.

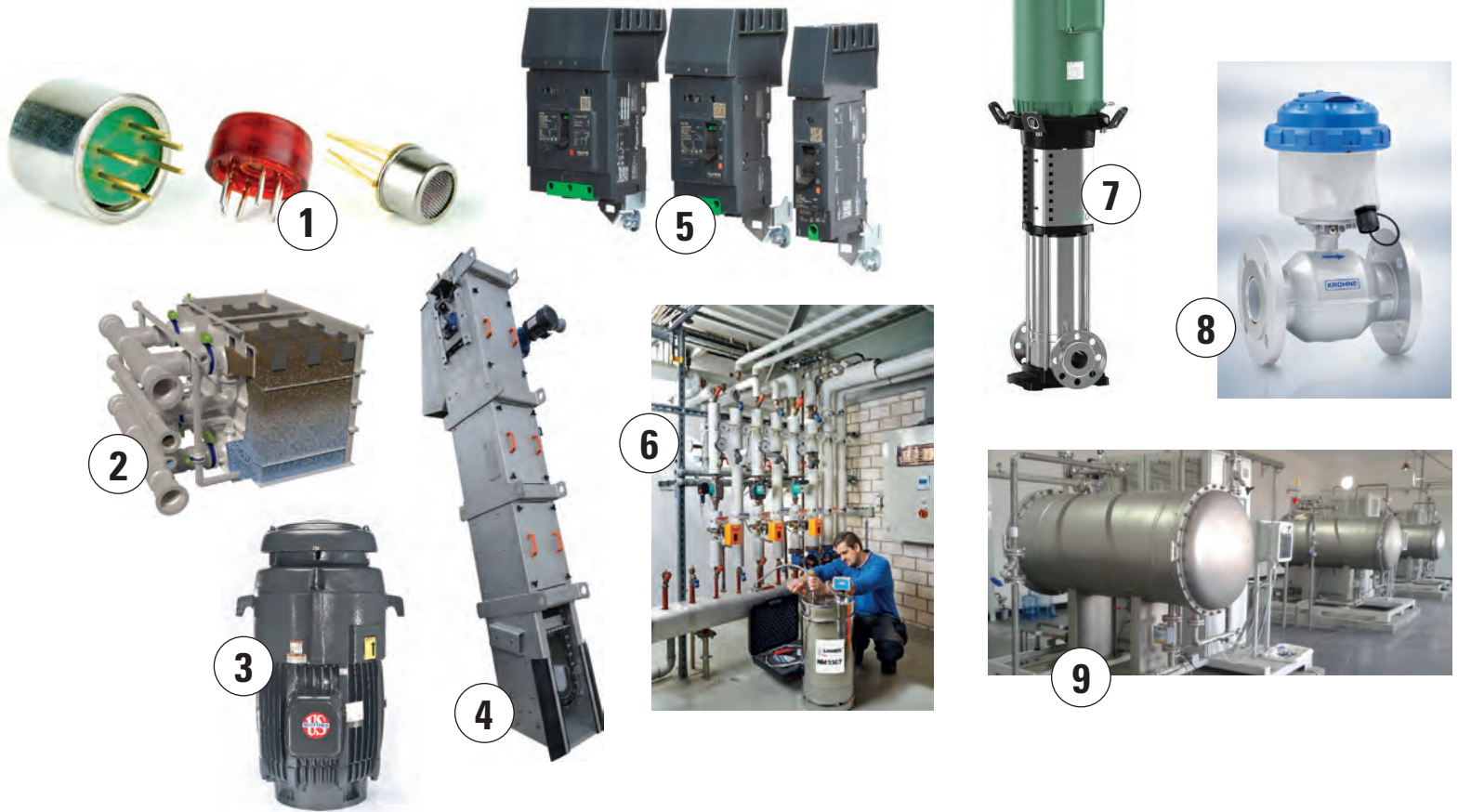
### Solution

The company chose **Trident Processes** to replace the outdated press with an **MD 413 Dewatering Press** that receives anaerobically digested biosolids after thickening with a membrane system. The flow to the press is controlled by a SEEPEX progressive cavity pump on a variable-frequency drive. The filtrate flows to a side tank and is sent to the aeration system by a small centrifugal pump on a variable-frequency drive. The press yields material at 15 to 20 percent solids.



### RESULT

“The automation of this press allows us to make changes remotely; but even better, the trends allow us a window into the digester,” says the plant's operations manager. “We have improved the cake dryness but have really improved on filtrate, allowing us to run the filtrate directly to the aeration system. And the automation package has made the operation much easier.” 800-799-3740; [www.tridentprocesses.com](http://www.tridentprocesses.com) tpo



**1. ALPHASENSE P-TYPE METAL OXIDE SENSORS**

P-type metal oxide sensors from Alphasense are broadband, total VOC detectors with a range of 0 to 100 ppm and a 10 to 50 ppb detection limit, depending on the VOC. Applications include process monitoring, occupational safety, leak detection and environmental monitoring. Typical VOCs measured by the sensor include solvents, sterilants and petrochemicals. [www.alphasense.com](http://www.alphasense.com)

**2. SUEZ FILTRAFAST EXTREME-RATE COMPRESSIBLE MEDIA FILTER**

The FiltraFast media filter from SUEZ is designed for treatment of high flows and includes compressible media to enable up to 10 times the loading rate of conventional media filters. The high-rate downflow gravity or pressure filter uses hydraulic loading to create the required media porosity with no mechanical compressing devices. The backwash sequence is designed to enable maximum recovery, extend media life, and limit energy consumption. FiltraFast units are available in different configurations and can be customized to specific applications. Based on project requirements, units can be fully shop-assembled and delivered, or erected on site. **800-446-1150; [www.suez.com](http://www.suez.com)**

**3. NIDEC MOTOR INVERTER DUTY VERTICAL TOTALLY ENCLOSED FAN COOLED MOTORS**

Nidec Motor's vertical TEFC inverter duty motors are for use on turbine, mix flow, and propeller pumps and range from 5 to 300 hp. They are suitable for VFD operation per NEMA standards. The pump shaft is extended through the hollow shaft, so adjustments required to lift impellers and give a running clearance with the pump casing can be made by a nut threaded on the shaft at the top portion of the motor. **888-637-7333; [www.usmotors.com](http://www.usmotors.com)**

**4. LAKESIDE EQUIPMENT RAPTOR MULTI-RAKE BAR SCREEN**

Lakeside Equipment's Raptor Multi-Rake Bar Screen is designed to remove inorganic solids from wastewater in municipal and industrial applications. A heavy-duty design provides durability and long life in severe conditions. High removal efficiency and low headloss are achieved with multiple rakes cleaning the screen, and with rake teeth penetrating the bar openings to positively remove captured material. The screen has all stainless steel construction to resist corrosion and requires minimal headroom above the operating floor. Rectangular or trapezoidal screen bars are available with 3/16-inch minimum bar spacing. Other features include a durable stainless steel roller chain, replaceable rake teeth, a maintenance-free lower chain guide or optional lower sprocket assembly, and automatic reversing to clear obstructions. **630-837-5640; [www.lakeside-equipment.com](http://www.lakeside-equipment.com)**

**5. SCHNEIDER ELECTRIC POWERPACT B CIRCUIT BREAKER**

Schneider Electric's PowerPact B-frame circuit breaker replaces the legacy FA/FH series with upgraded features, including an expanded amperage range of 15-125A and field installable accessories, while keeping the same mounting space dimensions. The Everlink wiring lugs maintain a constant contact with fine-stranded conductors, and every breaker includes a QR code to provide access to online product information and customer care center contact information. The breakers meet global electrical standards including UL, CSA, NOM, IEC and CCC. **888-778-2733; [www.schneider-electric.us](http://www.schneider-electric.us)**

**6. LANXESS / INTERNATIONAL DIOXIDE LEWATIT NM 3367 MIXED-BED EXCHANGER**

Lewatit NM 3367 mixed-bed ion exchange resin from LANXESS is



## water: product spotlight

### Biological filtration for groundwater treatment

By Craig Mandli

While there have been multiple advances in saltwater and wastewater purification over the last several years, groundwater continues to be the primary water source for most communities in North America. But with limited support staff, shrinking operating budgets, and an increasing need to provide treatment for a growing list of contaminants, water utilities face many hardships. The **biotta** (biologically tailored, two-stage treatment approach) **biological filtration system**, manufactured by Carollo Engineers and distributed in the U.S. by **AdEdge Water Technologies**, leverages nature to offer an affordable and sustainable solution for well-head treatment of inorganic and organic contaminants.

The fixed-bed, dual-stage biotreatment cultivates a robust environment for microbiological organisms to destroy contaminants or reduce elements to simple nonharmful forms. Developed specifically for drinking water applications, the fixed-bed treatment process consistently addresses contaminants at low levels, intermittent or fixed operation; and the dual-bed assimilates a complete packaged biotreatment plant with a dependability required for protecting public health.

“Biological treatment for municipal drinking water in the United States is the most sustainable and long-term, cost-effective solution for the treatment of nitrate, chromium VI, perchlorate and other contaminants from drinking water,” says Rich Cavagnaro, president and CEO of AdEdge Water Technologies. “Carollo Engineers has been a leader in this field, and we bring our strong sales distribution and manufacturing capabilities to the mix to commercialize this innovative technology in the marketplace.”



biotta biological filtration system from AdEdge Water Technologies

The technology accelerates naturally occurring treatment processes in a bioreactor where microorganisms in the raw water are given precise levels of food and nutrients to enhance their contaminant-removal capability. The vessels contain granular activated carbon, which creates a favorable environment for the bacteria to reproduce and thrive. The microbes destroy the contaminants or reduce them to harmless forms.

The low-energy process eliminates contaminants from the environment rather than creating concentrated waste. The low-volume discharge can be easily managed, and the process does not require extensive operator attention or experience. The low-energy system eliminates nitrate from the environment rather than concentrating it, which eliminates high-strength brine streams and the addition of salt to a given watershed. Hydraulic and water treatment performance is independent of raw water quality and treatment goals and is insensitive to wide swings in operating conditions. It is comparable in design and operation to conventional granular media filtration. In addition, the system is highly automated, reducing the need for extensive operator attention. **866-823-3343; www.adedgetech.com**

used to demineralize water used to charge and top up modern hot-water heating systems. The system prevents scale formation in the parts of the heating system that convey water and also provides protection against corrosion. The higher proportion of anion exchange resin ensures a long service life and efficient demineralization with the new mixed bed. A process used to reload the resin results in efficient hydroxide ion loading of over 90 percent. **401-295-8800; www.lanxess.com**

#### 7. WILCO USA HELIX V MULTISTAGE PUMP LINE

Wilco USA's extended range of the Helix V high-efficiency pump line is a nonself-priming, high-pressure, vertical, multistage centrifugal pump with inline connections and is suitable for a wide range of applications. The pump is available in 6- and 8-inch sizes, has full 304 stainless steel construction, an efficient NEMA motor, cartridge seal for easy replacement and an improved hydraulic performance. It is NSF 61 certified for potable water. **888-945-6872; www.wilco-usa.com**

#### 8. KROHNE WATERFLUX 3070 FLOWMETER

The updated WATERFLUX 3070 flowmeter from KROHNE provides precise measurement, no moving parts and maintenance-free service. The battery-powered electromagnetic unit is ideal for drinking water applications and is useful where power is unavailable. It has built-in flow, pressure, and temperature measurement with one sensor, allowing for readings in leak-detection systems. It provides real-time data

including water zone balance, water abstraction, pressure management or water billing. It requires no ongoing maintenance, and no inlet or outlet straight runs or filters are needed. The rugged IP68 polycarbonate remote converter housing comes standard with waterproof connector plugs. **800-356-9464; www.us.krohne.com**

#### 9. DE NORA WATER TECHNOLOGIES OZONE SYSTEM

De Nora Water Technologies ozone disinfection systems cover a range from small compact units to turnkey plants. Applications include treatment of municipal drinking water and wastewater, micropollutant removal, industrial wastewater and process water treatment, advanced oxidation, and biological solids reduction. Using natural oxidants, on-site ozone generation does not create a residual biological byproduct. It provides quick reaction time and requires no chemical compounds. Pilot plants and testing and scale units are available. **215-997-4000; www.denora.com**

#### THE LINDE GROUP OZORA OXYGEN RECOVERY SYSTEM

The OZORA oxygen recovery system from The Linde Group is designed to reduce oxygen consumption during the production of ozone. The technology has municipal and industrial water treatment applications. The system separates ozone and recycles oxygen back to the ozone generator, reducing oxygen consumption by up to 60 percent. OZORA systems can be sized to match new ozone generation units or engineered to retrofit existing water treatment operations. **800-755-9277; www.lindeus.com**

(continued)

# wastewater: product spotlight

## Providing simplified facility management

By Craig Mandli

As the day-to-day operation of water and wastewater plants becomes more technologically advanced, operating systems need to follow suit while still allowing operators to have uncomplicated control. The **Aquavista digital service platform** for water and wastewater facilities from **Veolia Water Solutions & Technologies North America** does just that, as it is designed to provide a flexible range of customized digital solutions, helping personnel efficiently run their plants.

The technology aggregates data from multiple systems that can then be enriched through a suite of intelligent water process applications and algorithms. All features are available to operators in real time in the form of a dashboard overview that helps personnel make sound business decisions for their plant.

“It’s an integrated range of digital services that enable utilities and industries to remotely and constantly monitor and diagnose problems, prioritize, and manage maintenance issues and use data to optimize all aspects of the treatment plant,” says Aquavista Business Development Director Dr. Veronique Bourquier. “The platform has been developed and designed by treatment experts, and we believe it is the most advanced cloud-based solution on the market today.”

The digital service platform can help improve asset performance and efficiency; reduce costs for operations, capital, maintenance, chemicals and energy; enable an overview of a plant and equipment from remote locations; and optimize efficiency through faster response to events and proactive intervention.

“Aquavista can be implemented for a single technology, a range of equipment, or for the complete industrial or municipal water or waste-



Aquavista digital service platform from Veolia Water Solutions & Technologies North America

water treatment plant,” Bourquier says. “It is embedded in Veolia’s standard water technologies and can be integrated in all our projects and also with our operations and maintenance contracts. It can, as such, be implemented as a service at any existing plant incorporating Veolia technologies as well as non-Veolia technologies.”

In addition, the technology can minimize environmental impacts and promote sustainability, increase safety by leveraging predictive analytics, promote security and reliability through use of an advanced and cloud-based system, provide flexibility through an intuitive dashboard adapted to users’ needs and specifications, and enable monitoring multiple sites anywhere and anytime through a single secure portal. It is designed with web security as one of the main priorities, with device and network security being fully integrated at every level within the framework of the solution. **800-337-0777; www.veoliawatertech.com**

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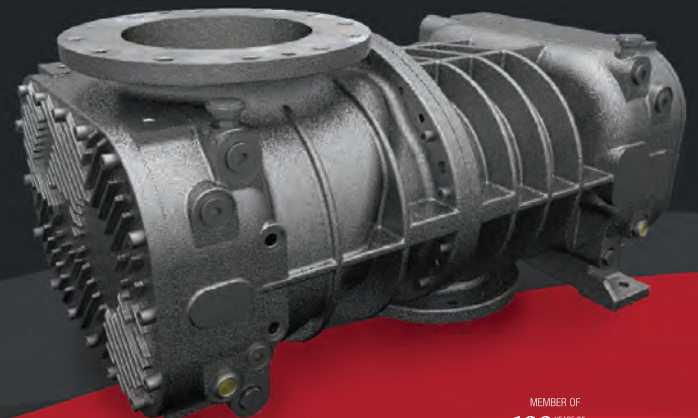
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**industry news**

**REXA's president and CEO to retire, new leadership announced**

REXA's president and CEO, Sam Lalos, announced his plans to retire at the end of 2017. Geoff Hynes has been appointed president and CEO effective Jan. 1, 2018.

**Trident Processes receives 2018 Canadian Business Excellence Award**

Trident Processes has received the Canadian Business Excellence Award for Private Businesses, given annually to 25 private businesses in Canada. The award is presented by Excellence Canada and PwC Canada and is in recognition of Canadian businesses that demonstrate exemplary performance of strategic plans and exceptional achievement of business goals.

**Peeters named new chief operating officer at Parkson**

Parkson announced that Clare Peeters will join the company as its chief operating officer. She will be responsible for all operational, manufacturing, administrative, human resource and strategic oversight for the corporation. Prior to her role at Parkson, Peeters was a vice president and managing director of corporate development at Axel Johnson, where she was responsible for evaluating new investment opportunities, including in the water and wastewater treatment sector, and providing strategic and operational support to Axel Johnson's portfolio of companies.



Clare Peeters

**SUEZ holds groundbreaking at new laboratory in Texas**

SUEZ broke ground on a new laboratory in Tomball, Texas, located north of Houston, that is expected to open in mid-2018. In addition to continuing the research and development of specialty chemicals for the industrial segment, the new facility will expand to include further process innovation in the oil and gas industry, focusing on global upstream and downstream applications.

**Badger Meter acquires assets of Carolina Meter & Supply**

Badger Meter announced it has signed an agreement to acquire the assets of Carolina Meter & Supply, based in Wilmington, North Carolina. Following the acquisition, Carolina Meter & Supply will do business as National Meter & Automation, Badger Meter's wholly owned distribution sales organization.

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states and courses. Call 386-574-4307 for details. (oBM)

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**Water Environment Federation alliance promotes brewing of beer with water reuse**

The WEF has convened the Pure Water Brewing Alliance as an informal group of utilities, brewers, associations, and companies interested in the use of purified water for brewing beer. The aim is to build public understanding of the water cycle, showcase water treatment technology, and advance water sustainability through reuse. tpo

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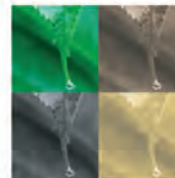
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## people/awards

**Trident Processes** received a 2018 Canadian Business Excellence Award for Private Businesses from Excellence Canada and PwC Canada. Trident Processes of Abbotsford, British Columbia, commercialized a process for recovering and repurposing resources from municipal wastewater and livestock manure.

**SouthWest Water's Riverview Water Resource Recovery Facility** received the Best Operated Wastewater Plant Award in its category from the Alabama Water and Pollution Control Association. The company's **North Shelby Water Resource Recovery Facility** received a second place Award of Excellence.

**Newterra** received the 2017 Global Technology Leadership Award from Frost & Sullivan for its modular (packaged) wastewater and water treatment systems.

**Bill Riley**, director of water utilities for the city of San Angelo, Texas, has retired. He has been a water utility professional for more than 30 years and took the San Angelo role in 2014. He oversaw operations and infrastructure related to water supply, production, distribution, quality, and conservation as well as wastewater treatment, maintenance, billing, and customer service.

**Rawley Ross** was named the wastewater treatment plant superintendent/plant operator for the new wastewater treatment plant in Geneva-on-the-Lake, Ohio.

**Baltimore** landed in the Top 10 among American cities with the best drinking water, according to *Best Life* magazine online.

The **Liberty (Missouri) Utilities Operations Center** was named Project of the Year by the Design-Build Institute of America/Mid-America Region. The facility also earned an Honor Award for Civil Infrastructure. The operations center and wastewater treatment plant was the first design-build project to receive State Revolving Fund financing and the largest treatment plant in the state to use design-build delivery.

The **Gasification Initiative** in Lebanon, Tennessee, received 2017 Project of the Year honors from the Tennessee Chapter of the American Public Works Association. The project will convert wood, tires and biosolids into electricity for the wastewater treatment plant and biochar soil amendment for sale to the community.

The **Pine Bluff (Arkansas) Wastewater Utility** received a National Environmental Achievement Award in the Operations & Environmental Performance category from the National Association of Clean Water Agencies.

The **Municipal Authority of the Township of Robinson (Pennsylvania) Groveton Water Treatment Plant** received the Presidents Award from the Partnership for Safe Water.

**Roger Hagman**, water system operator for the city of Bemidji, Minnesota, received the Operator's Meritorious Service Award from the Minnesota Section of the American Water Works Association.

## events

### Feb. 4-7

New York Water Environment Association Annual Meeting & Exhibition, New York Marriott Marquis, New York. Visit [www.nywea.org](http://www.nywea.org).

### Feb. 6

Central States Water Environment Association Innovative Approaches to Wastewater Operational Problems, Holiday Inn, St. Cloud, Minnesota. Visit [www.cswea.org](http://www.cswea.org).

### Feb. 6-8

AWWA Hawaii Section Pacific Water Conference, Hawaii Convention Center, Honolulu. Visit [www.hiawwa.org](http://www.hiawwa.org).

### Feb. 7-10

Water Environment Federation Midyear Meeting, Grand Hyatt Atlanta, Buckhead, Georgia. Visit [www.wef.org](http://www.wef.org).

### Feb. 12-14

California Water Environment Association Annual P3S Conference, Riverside Convention Center, Sacramento, California. Visit [www.cwea.org](http://www.cwea.org).

### Feb. 20-21

AWWA Best Practice Water Audits and Loss Control Programs Seminar, Fairmont Chicago, Millennium Park, Chicago. Visit [www.awwa.org](http://www.awwa.org).

### Feb. 20-23

Utility Management Conference, jointly presented by the WEF, AWWA and Water Environment Association of Texas, Hyatt Regency Riverwalk, San Antonio. Visit [www.wef.org](http://www.wef.org).

### Feb. 21-24

Water & Wastewater Equipment, Treatment & Transport (WWETT) Show, Indiana Convention Center, Indianapolis. Visit [www.wwettshow.com](http://www.wwettshow.com)

**Doug Ahrens**, Public Works director in Danville, Illinois, was named Danville Sanitary District director, replacing Shelly Koers, who retired.

The city of Ashland, Oregon, named **Paula Brown** Public Works director.

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