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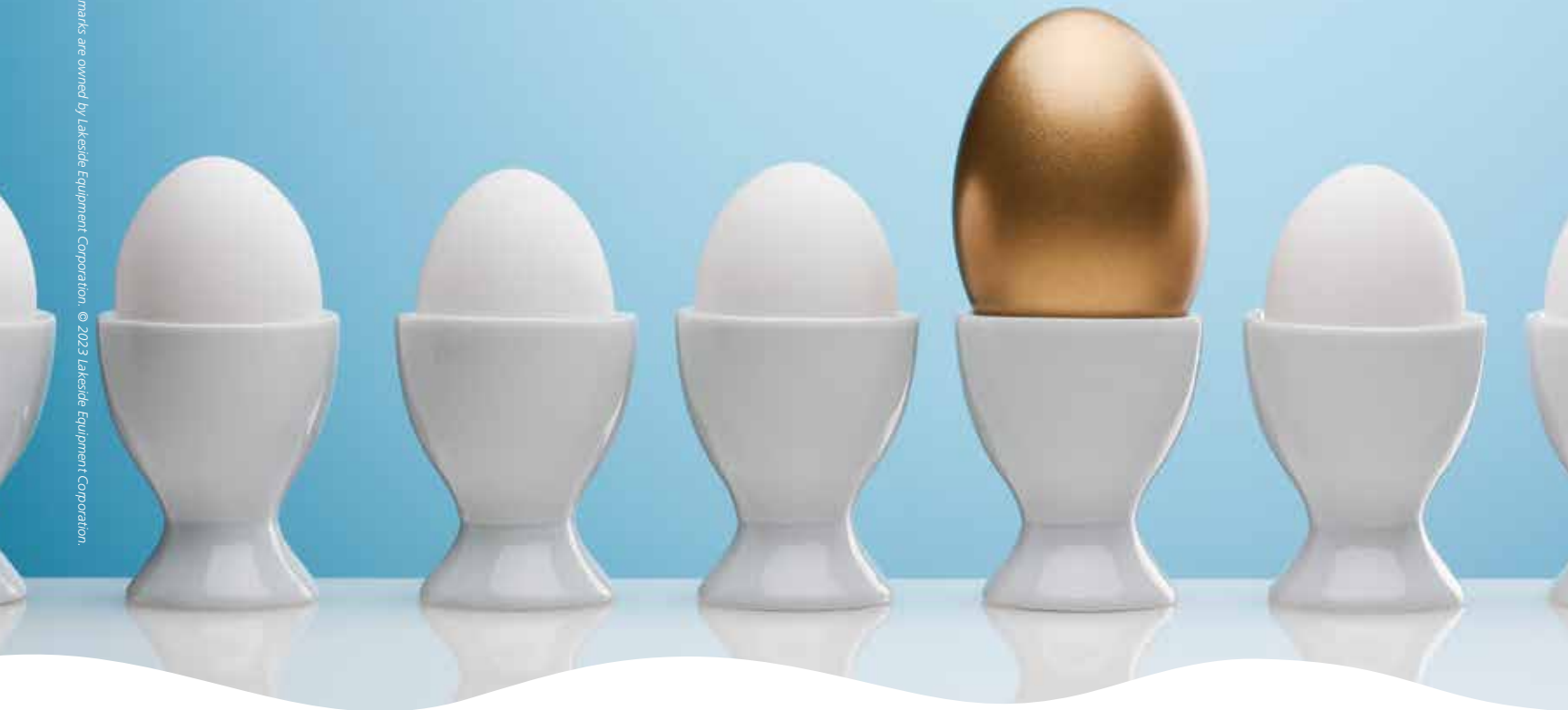


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ON THE COVER: Farmers and ranchers across southeast Texas and in states as far away as Florida benefit from the biosolids produced by the Houston wastewater treatment utility. They're spreading Class A exceptional quality Hou-Actinite, a 6-3-0 biosolids fertilizer processed and heat-dried at the city's 69th Street and Almeda Sims wastewater treatment facilities. "People like it," says Tika Gautam, P.E., supervising engineer of the biosolids processes. (Photography by Jon Shapley)

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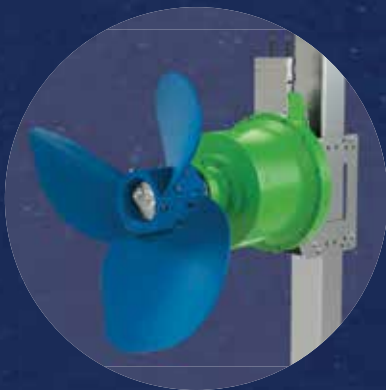
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let's be clear

Regulations Revisited

THE CLEAN WATER ACT HAS BEEN ENORMOUSLY EFFECTIVE SINCE ITS PASSAGE IN 1972. BUT IS IT TIME TO REVISIT ITS PROVISIONS AND APPROACH?

By Ted J. Rulseh



It's hard to name a federal law or regulation that has done more good than the Clean Water Act.

Passed in 1972 with the lofty aim of making the nation's heavily polluted lakes and streams fishable and swimmable, the act has brought enormous progress. A poster child for the act's success is Lake Erie, which had been written off as dead, but within a relatively short time was reborn and became an incredible wall-eye fishery.

Today the work continues, but at least one influential industry group sees a need for changes in approach.

The National Association of Clean Water Agencies in recent years has worked with the U.S. EPA and Congress on ways to streamline and simplify the act's regulatory framework, aiming to give utilities more flexibility in meeting their obligations to protect public health and the environment.

This makes sense in a climate where public and private entities routinely go beyond what laws require, on issues from clean water, to clean air, top sustainability and climate change.

To cite just a couple of examples, clean-water plants routinely outperform their effluent permits, and by wide margins. Meanwhile, many states, counties and cities, not to mention corporations, have broad and aggressive plans to reduce carbon emissions, although not required by any federal or state regulations to do so.

BEYOND COMMAND AND CONTROL

In my observation, an environmental ethic has taken hold that organizations nearly across the board are responding to. Regulations like those under the Clean Water Act have tended to emphasize command and control with enforcement by way of consent decrees and fines as the hammer. That was no doubt necessary 50 years ago when our society was used to treating lakes and rivers like sewers and the concept of pollution control was new.

Times have changed, and greatly. Corporations feel public pressure to operate sustainably. Public entities like utilities do as well, but through my contacts with clean-water and drinking water operators, I notice something more fundamental.

Operators in an important sense are true environmentalists. They continuously strive for a better end product not because of public pressure but because they see it as their job. They take intense pride in it. And so, where is the dire need for command and control over what they do?

A PLACE FOR PARTNERSHIP?

In line with that, NACWA sees a need for what might be described as a kinder, gentler approach, one that regulates in ways that encourage efficiencies, innovation and cost savings.

More to the point, the association argues that utilities, through decades of working effectively to safeguard the environment and improve the waterways, have earned the right to operate as partners in setting the regulatory agenda.

After all, who knows more about making clean drinking water and high-quality effluent than the people who do it, or oversee it, every day of their

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working lives? Wouldn't regulators benefit more from tapping into operators' knowledge and expertise than from handing down edicts?

One example of a more flexible approach to regulation lies in the dealing with nutrients that cause algae blooms and, in extreme cases, "dead spots" in places such as the Gulf of Mexico and the Chesapeake Bay. To date, regulation has focused mostly on point sources, including the outfalls of clean-water plants, when other sources like failing septic systems and runoff from farm fields and urban streets are also significant and possibly larger contributors.

Toward that end, a concept called adaptive management has come to the fore. Under that approach, instead of spending millions for plant upgrades to meet ever-stricter effluent phosphorus limits, utilities can work within the watershed to reduce nutrient inputs from farms and other nonpoint sources, often producing greater net nutrient reductions at less cost.

ASSISTANCE VS. ENFORCEMENT

NACWA has also advocated, successfully, for a change of emphasis within the EPA from enforcement to compliance assistance as the best way to accomplish the goal of protecting water quality. In fact, four years ago, the EPA officially changed the name of its key priorities from National Enforcement Initiatives to National Compliance Initiatives.

This change acknowledged that heavy-handed enforcement and the meting out of penalties are not and shouldn't be the only tools in regulators' kits. The underlying assumption here is that utilities want to, can and will do the right things for the waterways if given the freedom to innovate. They may simply need helping in deciding what changes to make and how to make them in ways that are affordable and technically feasible.

Changes like these signal an era in which utilities and regulators are not adversaries but are on the same team, working to benefit the environment and society. It's a way to help ensure that progress toward the goal of fishable and swimmable waters will continue. **tpo**

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San Francisco Biosolids Project

San Francisco Public Utilities recently selected three Cambi thermal hydrolysis technology systems for new biosolids digester facilities. The technology will allow the SFPUC to enhance odor control, boost energy recovery and reduce the plant's environmental footprint.
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“Even small changes in the Lead and Copper Rule Revisions warrant careful consideration by the EPA, state primacy agencies, water systems and the public.”

AWWA Applauds EPA's Request to Halt Litigation Over Revised Lead and Copper Rule
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MAN-MADE WETLANDS

A Natural Barrier to Microplastics

Constructed wetlands, built to treat wastewater and stormwater runoff, act as a barrier preventing the spread of microplastics through the environment, a study has found. In this online article, read about how researchers investigated the distribution of microplastics in water and sediment at five constructed wetlands.
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VIRUSES AND WWTPS

Environmental Impacts

New research from Chalmers University of Technology in Sweden reveals the implications for the surrounding environment in the event a wastewater treatment plant gets “sick” from a virus. Researchers measured the concentration of virus particles that were released from four different facilities and compared this with how much organic carbon was released at the same time.
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With Help From Mother Nature

The team at the South Walton Utility Co. includes, from left, Blair McNaughton, water operator; Joe Ream, director; Mark Hurt, water operator; and Jared Duncan, operations supervisor.



THE LIMESTONE FILTERING QUALITIES OF THE FLORIDAN AQUIFER MAKE DRINKING WATER PROCESSING EASY FOR SOUTH WALTON UTILITY COMPANY

STORY: **By James Careless**

PHOTOGRAPHY: **Jeff Haller**

The water treatment professionals at South Walton Utility Co. were grateful to win a 2021 Drinking Water Treatment Plant Award from Florida Department of Environmental Protection for medium-size community systems.

But they weren't surprised: Over the years the utility has won many awards and much praise for the quality of its drinking water. That's partly because the utility, in Miramar Beach, draws most of its water from the Floridan Aquifer, whose limestone composition does an incredible job of filtering out debris and impurities.

"In fact, the water we get from the aquifer is of such high quality that all we have to do is chlorination," says Joe Ream, water and wastewater director for the utility. "It doesn't have to be treated in any other way, aside from disinfection."

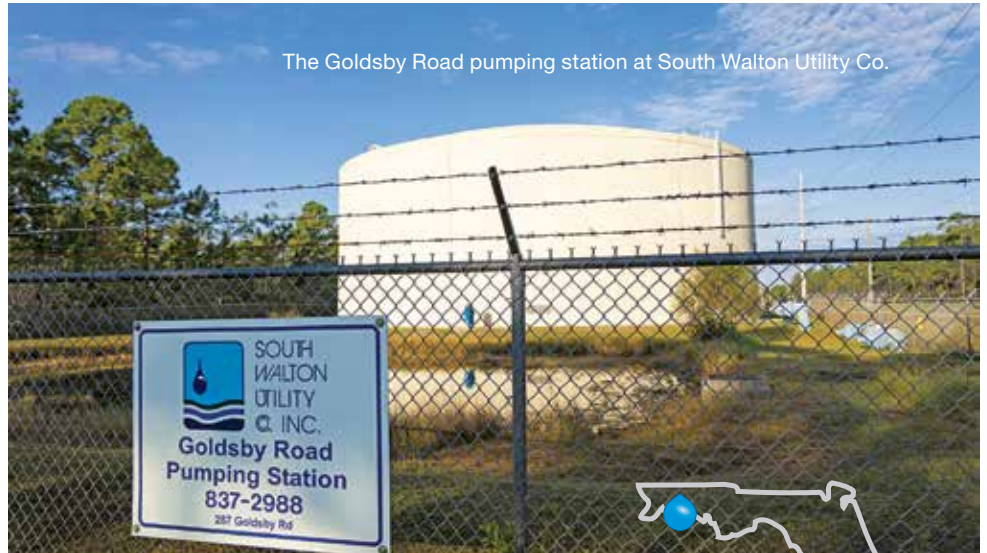
Alicia Keeter, general manager, observes, "The aquifer water even has naturally occurring fluoride. So we're blessed in having Mother Nature do most of our job for us. As operators and keepers of this drinking water system, we maintain very high standards in maintenance, upkeep and rehabilitation when necessary, to complete the process.

"We also have a great team of operators who take their work seriously on testing, treatment, flushing, following all the rules and regulations as best we can to the letter."

NO FREE RIDE

Launched in 1968 to serve just 100 water and wastewater customers, South Walton Utility Co. started with one well tapping the Floridan Aquifer. As its membership base and reach expanded, so did the utility's capacity, with the addition of coastal wells that provided water requiring conventional filtration and processing. It now serves 26,035 customers in 11.2 square miles of Okaloosa and Walton counties in Northwest Florida, delivering on average 6.6 mgd through 200 miles of water mains.

"Today, we have six coastal wells, which are considered to be water plants because they have chlorination systems on site," says Ream. Their outputs are pumped to two 2-million-gallon central concrete ground storage tanks. There the water is treated and sent to the utility's coastal service area, along with the water drawn from the aquifer.



The Goldsby Road pumping station at South Walton Utility Co.

South Walton Utility Co.

Miramar Beach, Florida

www.swuci.org

ESTABLISHED:
1968

POPULATION SERVED:
26,000

SERVICE AREA:
11.2 square miles in Okaloosa and Walton

EMPLOYEES:
39

FLOWS:
16.416 mgd design, 6.6 mgd average

SOURCE WATER:
Floridan Aquifer

SYSTEM STORAGE:
10.3 million gallons

DISTRIBUTION:
200 miles of water mains

ANNUAL BUDGET:
\$2.2 million (operations)

KEY CHALLENGE:
Interest young people in the industry and motivate them to become leaders of the future workforce.

Each coastal water plant is housed in a structure enclosing a 600-foot-deep well shaft, with a US Motors submersible pump (Nidec) suspended at the 200-foot level. As the water is drawn from the well, the three-stage pump sends it to the storage tank. This creates a vacuum in the system, which draws chlorine out of a Regal injection system (Chlorinators Incorporated).

"We then test the water daily to make sure the chlorine level is right, adjusting the injection system as needed," Ream says. "This ensures that the chlorine level is correct across the system as we send the treated water to the distribution system."

Meanwhile, the clean water from the inland wellfield plant goes into two concrete ground storage tanks with a total capacity of 4.8 million gallons.



Jared Duncan, one of 39 South Walton Utility team members, records electrical data on the pumps and motors at the Goldsby Road pumping station.

Booster pumps in the facility send the water to the distribution network.

A sodium hypochlorite system is used to boost the chlorine residual as a polishing step. The water is chlorinated at the inland system before arrival at the pump station. Chlorine is only added, using the injection method, when the water is extracted for distribution. Otherwise, it sits in storage just as Mother Nature made it.

MAINTENANCE MATTERS

This utility has a staff of 39. “We have a very detailed maintenance program,” says Keeter. “For example, we have a rigorous fire hydrant flushing program to make sure we keep the water flowing throughout the service area. We also have a robust sampling program to make sure the chlorine levels are not too high nor too low.” Sampling is performed at 100 sample collection stations throughout the distribution system.

Ream began his career with the utility as a wastewater trainee in 1995. He immediately began taking classes to become a wastewater operator, obtaining his Class A license in 2001. Shortly thereafter, he transferred to Water Operations and moved up the ranks.

“The water we get from the aquifer is of such high quality that all we have to do is chlorination.”

JOE REAM

“Jared Duncan is the water operations supervisor with a Level B license who works directly under me,” Ream says. “We also have three Level C water operators: Mark Hurt, Debbie Gavins and Blair McNaughton.”

Ream believes the secret to staff management is ensuring that everyone knows what is happening at the utility and takes a hand in solving problems. “You need to keep them involved in what’s going on and keep them updated on any issues that you’re having,” he says. “It helps that our people know the importance of what we do and care about making sure our water system is working well for our community.”

To boost team members’ commitment, the utility links financial and other incentives to job performance. “We have a goals program to ensure that operators have skin in the game,” Keeter says. “It’s a direct correlation where, if they meet their goals, they are rewarded for it.”

Each quarter, team members have a list of goals they must meet to receive their incentives. Measured activities include fire hydrant maintenance, water loss reduction, conservation programming and others.

“With this type of participation, the employees are intimately familiar with the system and also have a hand in the upkeep of our valuable resource,” says Keeter. “This is a better system than spending money on outside contractors. It encourages our people to take ownership of our water system and take pride in it.”

“This is a better system than spending money on outside contractors. It encourages our people to take ownership of our water system and take pride in it.”

MEETING CHALLENGES

The benefits of tapping the Floridan Aquifer also pose the greatest challenge to the utility’s future. On the good side, according to *National Geographic*,

(continued)



South Walton team members receive financial and other incentives linked to job performance. Each quarter, team members have a list of goals they must meet.



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LOVING THE LIFE

When not keeping the drinking water clean for the residents of Miramar Beach and the surrounding area, team members at the South Walton Utility Co. enjoy all the natural wonders and constructed attractions Florida has to offer.

Add the lack of snow to shovel — offset by the ordeals of the occasional hurricane — and one can see why they love living in Florida. “We live and work where you all vacation,” says Alicia Keeter, general manager. “Everybody wants to be in our area, but we get to enjoy it every single day. We have the best of all worlds down here.”

Joe Ream, water and wastewater director, adds, “I’m not native to the area: I moved from Ohio to be here. This is one of the more beautiful places I’ve ever seen, and I get to live in it every day.”



Duncan checks the chlorine levels (Regal injection system from Chlorinators Incorporated) at the Goldsby Road pumping station. (MIOX water chlorination generator from De Nora)

the aquifer is an 82,000-square-mile reservoir that holds billions of gallons of freshwater. On the other hand, excessive extraction, rising sea level and growing risks of saltwater intrusion strain the resource.

South Walton Utility is focused on addressing the challenges. “We have an active conservation program that we work to communicate to our customers,” Keeter says. “Our point is to highlight water conservation not just as a money-saver but as the best way to preserve this precious resource because we don’t have an endless supply. Our water rate structure is set up to add financial penalties to discourage people from using excess water.”

“We live in Hurricane Central.”

ALICIA KEETER

the high winds and storm surges come. Our infrastructure has to be robust enough to ride this out. We also have a host of backup generators in place to keep the pumps going during the emergency.

Ream adds, “We really preach to our employees about being prepared for themselves, their families and their houses. They are also aware that even

Coping with the weather is another challenge. “We live in Hurricane Central,” Keeter laughs. “We are basically a barrier island with just three bridges linking us to the mainland. So we have to make sure that we can sustain our system when

though we are not listed as such, we are first responders. We need to make sure our system is back up and running as soon as possible after bad weather hits. You’re not doing anything in society without water and wastewater treatment up and running.”



Joe Ream, director of water and wastewater

SWEET TASTE OF SUCCESS

These requirements and challenges don’t change the fact that drinking water in Miramar Beach tastes especially good. That is because the utility strives to keep chlorine levels as low as safely possible, to minimize any obvious chlorine flavors and smells.

“This is why I like the taste of our water, and we have won several best tasting drinking water awards as a result,” Ream says.

Keeter jokes, “We love our water, but we don’t want everybody to know about it because we don’t want everybody coming to drink it. Maybe we shouldn’t be saying so much about it right now!”

Keeter has another challenge always in mind: “How do we get young people interested in our industry and motivated to want to become the leaders of our workforce for tomorrow? This is a question I constantly ask myself.

“This is a growing and challenging field we all chose, and the rewards of our work are plentiful. Our conversations need to investigate how to tap into the mindset of our up-and-coming youth and show them the benefit to society and themselves that our industry holds.” tpo

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STORY: **Jim Force** | PHOTOGRAPHY: **Jon Shapley**



Jemarcus Gaines, wastewater technician, works in a control room at the 69th Street wastewater treatment plant in Houston.

Twenty-one Sharples centrifuges (Alfa Laval) at the 69th Street plant operate alternately to produce cake at about 21% solids.

Farmers and ranchers across Southeast Texas and in states as far away as Florida benefit from the biosolids produced by the Houston wastewater treatment utility.

They're spreading Class A exceptional quality Hou-Actinite, a 6-3-0 biosolids fertilizer processed and heat-dried at the city's 69th Street and Almeda Sims wastewater treatment facilities. Some of the material is mixed with chemicals and sold in retail stores for use by landscapers and gardeners.

"People like it," says Tika Gautam, P.E., supervising engineer of the city's biosolids management processes. "Customers often ask for more than we have."

Gautam received the 2021 Ronald B. Sieger Biosolids Management Award from the Water Environment Association of Texas. He earned civil engineering degrees from Tribhuvan University in his native Nepal, and from Lamar University in Texas. In addition to his engineering credential, he holds a Class C Wastewater Operator license and is working to move up to Class B.

VAST OPERATION

Houston Water has one of the nation's largest wastewater systems. The utility serves 4.2 million residents in an area of more than 680 square miles. Wastewater flows through some 6,300 miles of pipes and 383 lift stations.

The utility maintains and operates 38 wastewater treatment plants with a combined capacity of 250 mgd. The activated sludge plants range from 0.15 to 200 mgd. The goal is to ensure that clean, safe effluent flows from the treatment system to the city's bayous. Private contractors operate five of the plants under five-year contracts. The utility operates the other 33.

All facilities are permitted by the Texas Commission on Environmental Quality and the U.S. EPA. Houston Water also operates and maintains three wet-weather facilities that collect and store high flows before treatment.

“We are committed to pursuing beneficial biosolids reuse options for our wastewater systems.”

TIKA GAUTAM

The solids are heat-dried to produce about 32,000 dry tons a year of Class A exceptional quality Hou-Actinite slow-nutrient-release fertilizer, also marketed as Sustanite or Cultivate.

The material is sterilized and pelletized, is easy to handle and contains 1% iron and a range of other micronutrients. It is also cheaper than chemical fertilizers. It blends easily, aerates the soil, helps the soil retain water during drought and is not easily washed away.

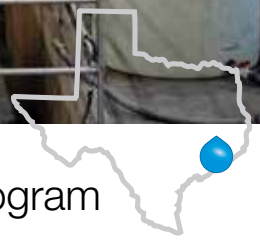
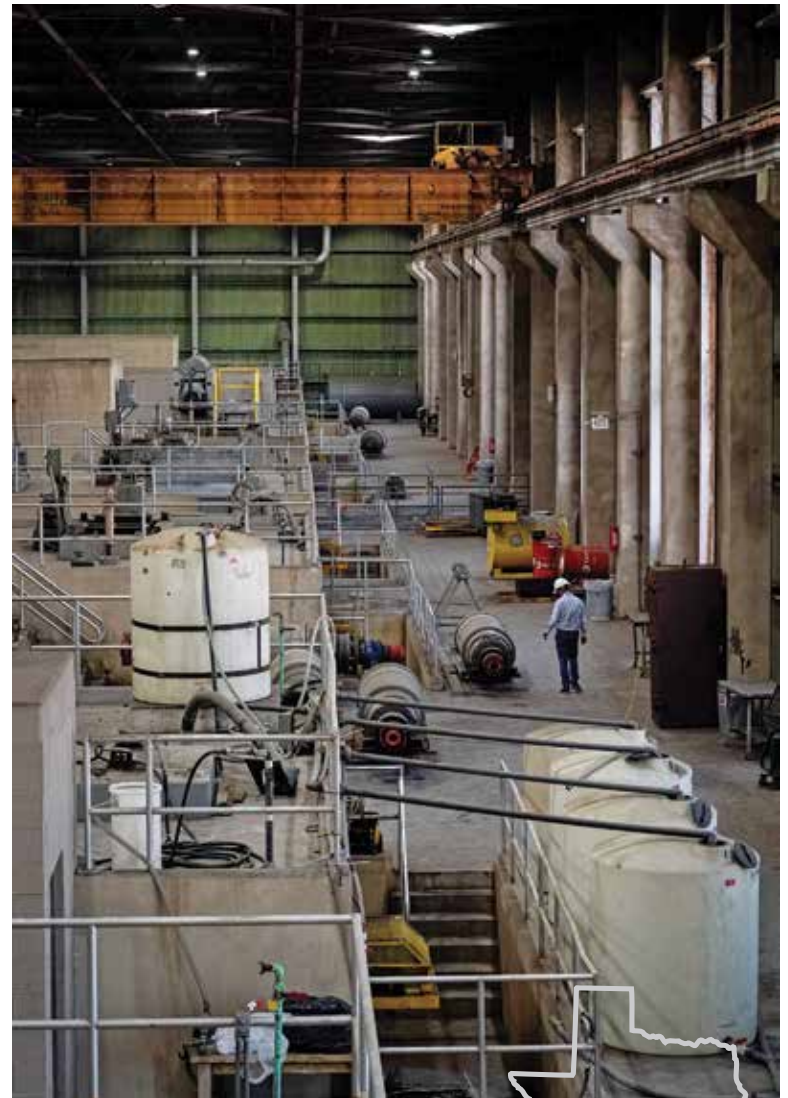
Currently, almost 13,000 dry tons per year of dewatered cake produced at 10 smaller plants are being landfilled. In the past, these materials were beneficially used as lime stabilized or aerobically digested Class B biosolids.

TREATING THE FLOW

The 69th Street and Almeda Sims plant produce the bulk of the biosolids. At 69th Street (200 mgd design, 80 mgd average), wastewater enters through influent lift stations and passes through multiple mechanical rake bar screens (Infilco Degremont) and aerated grit chambers that include grit pumps

The heart of the system is the 69th Street Wastewater Treatment Plant, permitted to treat up to 200 mgd with a peak flow capacity of 400 mgd. When constructed in 1983, it was the largest treatment facility in EPA Region 6.

The 69th Street facility processes most of the biosolids produced in the Houston Water system. It receives biosolids pumped or hauled in tankers daily from 14 of the smaller plants.



Biosolids Management Program

Houston, Texas

www.houstontx.gov

INITIATED:
1921

BIOSOLIDS PROCESS:
**Heat-dried (Class A);
lime stabilized (Class B)**

BIOSOLIDS VOLUME:
**32,000 dry tons/year Class A,
13,000 dry tons/year Class B**

END USE:
**Farms, ranches, golf courses,
landscaping**

AWARDS:
**2021 Ronald B. Sieger Award
for Biosolids Management,
Water Environment Association
of Texas**

(Vaughan), centrifugal blowers (Hoffman & Lamson, by Gardner Denver) and Gritt Mitt classifiers (WesTech Engineering).

The flow is split among eight pure-oxygen-feed nitrification activated sludge process trains, each with a first step covered reactor-clarifier followed by a second-step reactor and clarifier.

Waste activated sludge is pumped to thickeners, and then to dewatering and drying.

Effluent from the second-step clarifiers is polished in 38 newly installed tertiary disc filters (Veolia Water Technologies). The stream is disinfected with liquid chlorine and dechlorinated with sodium bisulfite before discharge to Buffalo Bayou.



Tika Gautam, left, supervising engineer, shown with Mohammed Siddiqui, assistant operations manager, received the 2021 Ronald B. Sieger Biosolids Management Award from the Water Environment Association of Texas.

At the Almeda Sims plant (20 mgd design, 12 mgd average), wastewater is pumped to multirake mechanical bar screens (Infilco Degremont) and grit removal (Smith & Loveless) before passing to seven open-top aeration basins. Five secondary clarifiers follow.

Secondary effluent flows to chlorine contact basins and then to dechlorination with sodium bisulfite before discharge to Sims Bayou. Waste activated sludge is screened and sent to the thickeners. The thickened solids are stored in digesters/aerated sludge holding tanks, then conditioned, dewatered and heat dried.



LEFT: Everett Hughes, utility mechanic, performs maintenance on a centrifuge. ABOVE: Gautam leads 70 team members devoted to the biosolids operation.

BIOSOLIDS RECYCLING

The road to beneficial use of biosolids begins with thickening, digestion and dewatering. The 69th Street plant uses 21 Sharples centrifuges (Alfa Laval) that operate alternately to produce a cake of about 21% solids. The cake is dried in seven Raymond Bartlett Snow flash dryers (Schenck Process) with a total evaporating capacity of 12,000 pounds per hour. The material is stored in 12 silos with a total capacity of 3,300 dry tons.

At the Almeda Sims plant, six Alfa Laval belt presses dewater the biosolids to about 16% solids. Then the material is dried in two rotary drum dryers (Andritz) capable of evaporating 17,000 pounds per hour. The dried pellets are stored in two silos with a combined 600 dry tons capacity.

“The dried biosolids produced at the two plants represent about 70% of Houston’s total biosolids production,” says Gautam. Most of the material loaded from the storage silos into 18-wheeler end-dump trucks for transport to end users. Some of the material fills one-ton bags that are picked up mechanically and hauled to golf courses and other application sites.

Nearly 70 team members are devoted to the biosolids operation. They include specialists from the wastewater treatment plants’ operations, process control, engineering, capital projects, maintenance and other staff, as well as laboratory personnel and senior executives.

CHALLENGES AHEAD

Houston's biosolids program faces challenges as its leaders look ahead. The most critical component is marketing and public acceptance of beneficial reuse.

"Producing a consistent quality product, balancing the market demand with the production, and managing product loading and shipping remain major challenges," says Tika Gautam, supervising engineer. "We have to compete with the prices of other commodities like oil, natural gas and chemical fertilizer in a changing economy and market."

Balancing production capabilities and market desires is key: "The critical control points are monitored and maintained to minimize dryer downtime, expedite repairs, provide preventive maintenance, and assess process data, faults and variances to determine corrective action."

One challenge is storing and handling biosolids during wet weather when land application sites are unavailable. Others include minimizing equipment downtime, introducing beneficial use of material that

is not heat-dried, increasing cake silo storage capacity, constructing a barn for temporary storage of trailers loaded with lime-stabilized solids, building temporary storage pads at the land application sites, and adding aerated storage digesters and holding tanks at the treatment facilities.

The city has been working to consolidate its treatment plants. That and other improvements are being addressed in capital improvement programs and a five-year engineering study of the system and its needs. Rehabilitating old dryers and centrifuges is part of that.

Climate neutrality is in the plan, too. The city aims to reduce greenhouse gas emissions, maximize recycling and reuse, use more renewal energy and recover wastewater resources to become energy-neutral to energy-positive. Says Gautam, "Rising energy prices, more stringent regulatory requirements, PFAS and other emerging contaminants and rising transportation and landfill fees are the big challenges we're facing now."



Tika Gautam,
supervising
engineer

GOING TO MARKET

The city partners with Automation Nation of Houston to market and sell its heat-dried fertilizers. "Since 2005, ANI has spent a lot of time and effort in establishing the biosolids beneficial reuse market," Gautam says.

Marketing the heat-dried product takes many forms. Before the COVID pandemic, the city organized the Houston Garden Show in front of City Hall. There, samples of the heat-dried products, along with flyers describing the production process and the product benefits, were distributed to the public.

The city also has organized plant visits and tours for local high school and college students, consultants and others. The tours highlight the benefits of biosolids fertilizers.

Houston began its wastewater recycling program in 1921, making it one of the oldest such initiatives in the country. "We are committed to pursuing beneficial biosolids reuse options for our wastewater systems," says Gautam. "These initiatives protect human health, environmental quality, are cost-effective and provide flexibility."

"In the early days of our operation, when some cities' wastewater solids were being dumped in the ocean, Houston was shipping heat-dried biosolids pellets by rail to citrus groves in Florida."

Limited landfill capacities and difficulties getting reuse of Class B biosolids permitted and accepted by the public were the driving factors for the city to invest in facilities to make heat-dried products for marketing and sale.

Those products have been winners for Houston Water, and for the many people who use them. **tpo**

“These initiatives protect human health, environmental quality, are cost effective and provide flexibility.”

TIKA GAUTAM

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Less Grass, Less Water

A COLORADO UTILITY PROVIDES MULTIPLE CONSERVATION PROGRAMS, INCLUDING EDUCATION AND FINANCIAL INCENTIVES TO ENCOURAGE WATER-SAVING LANDSCAPES

By Steve Lund

Many years ago Aurora Water started reaching out to the community about how to conserve water. Customers apparently drank in the information.

Per capita water use in this Colorado city dropped nearly 39% from 188 gpd in 2000 to 115 gpd in 2020. As a result, the utility serves many more people with the same amount of water.

Aurora Water, which serves a city of about 386,000 and part of the surrounding area, has three water treatment plants that distribute about 28 mgd in winter and 75 mgd in summer. “It started mostly with education, and I believe there was a focus on youth education at the time,” says Diana Denwood, senior water conservation specialist.

NUMEROUS OFFERINGS

“It has grown to encompass adult education. We’ve got informal adult education programs, multiple water conservation classes that we teach every year. This year there were over 25 classes. We’re kind of ramping things back up since COVID. Before COVID, we had over 30 classes per year.”

The classes are held in the utility’s demonstration garden, which shows off landscape plants that require little if any irrigation. Ranging from Sprinkler 101 to Installing Water Wise Landscapes and Building Your Own Drip Irrigation System, the classes are popular. Enrollment is capped at 30 people, and class registration is usually full.

“We also have things that are not obviously about water conservation but have something to do with having a water-wise landscape,” Denwood says. “For example, we have a Bee Condo Workshop that I’ve taught a couple times now.

“The idea is that you want to have water-wise flowering plants to feed the pollinator population, so let’s help that along by building bee condos. It’s not all directly about water conservation, but it’s adjacent, and it gets people into our water-wise demonstration garden.”

MANY MOTIVATIONS

Some participants are motivated by the chance to save on their water bills, but the classes draw people for other reasons, too. “A lot of people are interested in having a prettier, more vibrant yard,” says Denwood. “You accomplish that by taking out boring Kentucky bluegrass and putting in xeric flowers. That’s much more exciting.”

Class participants also appreciate the different types of pollinators and other wildlife that are attracted to their yards after they remove some of their grass and plant flowers and shrubs that use less water. “Also, people are realizing that water is a very precious resource, and they want to be part of a real solution,” Denwood says.

Aurora Water describes plants that need less irrigation as water-wise. That’s defined as needing 15 inches or less of water beyond the 15 inches of precipitation the region usually receives annually. Some plants actually need no irrigation once they are established.



Aurora Water encourages water-wise landscapes like this one with educational programs and rebates.

“A lot of people are interested in having a prettier, more vibrant yard. You accomplish that by taking out boring Kentucky bluegrass and putting in xeric flowers.”

DIANA DENWOOD

“Kentucky bluegrass in our climate needs 28 inches of supplemental water to thrive,” Denwood says. “A water-wise plant needs half the water or less.” The utility provides lists of plants that fit the criteria. They include more than 250 perennials, 200 shrubs, 40 grasses, along with seven trees.

“We don’t really push people to plant trees because they need more water, even in the winter if temperatures are warm,” Denwood says. “We don’t have a lot of trees native to the eastern plains of Colorado. We have cottonwoods, but they only grow in riparian areas. They need a lot of water. We encourage drought tolerant trees, which is a smaller list.”

BEYOND EDUCATION

The utility also provides free outdoor water use assessments. “It’s basically a full sprinkler system checkup,” says Denwood, “And we provide zone mapping, which is really important, especially for homeowner associations and large-property customers who often don’t have that basic information of where their controllers are and where all their zones are.”

Another outreach effort is the GreatScapes program for low-income property owners. Up to five properties per year receive water-wise landscapes at no cost. The landscapes use plants that require no irrigation once established, so the owners won’t have ongoing expenses for watering.

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Plants that Aurora Water considers water-efficient need half or less the irrigation than required by Kentucky bluegrass.

The landscape program also includes rebates for switching to water-wise landscapes and for water-saving irrigation system parts such as smart controllers, rain sensors and soil moisture sensors.

Aurora Water also promotes water-efficient landscaping with contests. For one, called Dreamscape, people submit videos that explain why they want a water-wise landscape. The entries are narrowed to five finalists, and the winner is then chosen by random drawing. The prize is a front-yard conversion to a water-wise landscape.

Another contest, held every year since 2013, has customers submit photos of their converted landscapes. The winner receives a \$100 water bill credit. Twelve customers entered in 2022.

New lawns and new irrigation systems require a permit in Aurora. “We are checking on efficiency and making sure that the new seed or sod has the correct soil amendments to set it up for a healthy start, because healthy grass uses less water,” Denwood says.

Lawn watering restrictions are in place from May through September: customers can water no more than three times per week, and never between 10 a.m. and 6 p.m., the hottest and windiest part of the day when evaporation is the highest. Water monitors enforce the restrictions, usually responding to complaints from neighbors.

INSIDE THE BUILDINGS

Beyond the landscaping initiative, the utility offers commercial and residential customers rebates for water efficient appliances like high-efficiency toilets that require just 0.8 gallons per flush. For low-income residents, Aurora Water works with the nonprofit Mile High Youth Corps to provide water-efficiency upgrades like aerators, showerheads and toilets for free.

Indoor water assessments are offered for residential and commercial properties. Every water fixture in the building gets inspected. In Denwood’s experience, some 75% of leaks are from toilets. “They waste thousands of gallons a month, sometimes quietly and sometimes not so quietly,” she says.

The city’s latest conservation weapon is smart meters, which will eventually be installed on every account. “Smart meters can really dig into your use,” Denwood says. “You can see how much water is flowing through a meter per hour, down to 15-minute intervals if you want to.”

Aurora also shares data and recommendations with customers. They can sign up for a Know Your Flow email, which gives them a monthly report card about their water use compared to the recommended use for that property, even considering irrigation: “Irrigation is complicated, because landscapes are complicated. It really helps people to compare their actual usage to recommended usage.” **tpo**

Career Starters

A SOUTH CAROLINA WATER AND SEWER AUTHORITY ADDRESSES THE WORKER SHORTAGE BY CREATING A HIGH SCHOOL INTERNSHIP PROGRAM TO FILL ENTRY-LEVEL JOBS

By **Sandra Buettner**

The Beaufort-Jasper Water and Sewer Authority needed to get younger people interested in water careers and at the same time fill job openings. Joe Mantua, general manager, worked with the human resources department to create a high school internship program. It targets high school students who may not go to college or don't know what they want to do after they graduate.

The internships give these students an early opportunity to take on a role that could lead to long-term employment with the utility. The program focuses on students with a technical education background or interest.

Beaufort-Jasper Water and Sewer Authority is based in Okatie, South Carolina, an unincorporated suburban community west of Hilton Head Island in Beaufort and Jasper counties. The authority collects, treats and recycles more than 9 mgd of wastewater and delivers an average of 20 mgd of drinking water to more than 150,000 residents. It also supplies drinking water to wholesale customers.

FILLING A NEED

The internship program began in 2021; it is still in its early stages and plans call for its expansion. It is open to students in all the public high schools in both counties.

The authority worked hand in hand with the both county school districts' Career and Technical Education offices, which encourage students to be career-ready through instruction in technical and employability skills and acquisition of industry credentials.

In March 2020, more than 60 students attended two open houses to solicit interest; the events included an overview of the organization and facility tours. Over several months, a plan emerged for the authority to host high school seniors in 15-week paid internships in spring 2021.

Authority staff, school counselors and career development facilitators used an initial internship application to prescreen, referencing students' career interest inventories and graduation plans. Students then experienced the authority's regular application and interview process. Once selected, each student and a parent or guardian signed a work-based training agreement to delineate expectations.

Phill Lovell, human resources talent partner for the utility, works with the counselors and interviews the candidates. "Some students graduate early, and so they are eligible to apply, as well as students still in school," Lovell says.

"The only requirement is that they be high school seniors looking for what they want to do after they graduate." The other reason for targeting high school seniors is that the entry level jobs the utility needs to fill don't require a college degree.

"The students who apply are anxious to get real-world work experience," Lovell says. The two main roles that interns apply for are in customer service



Beaufort-Jasper staff members are shown with their NACWA award. From left, James Baker Jr., chair of the board; Phill Lovell, human resources talent partner; Joe Mantua, general manager; and Sarah Linkimer, deputy general manager.

and field operations — entry level jobs within two of the utility's largest departments. The authority typically gets 10-12 internship applicants per year and narrows that down to six.

Internships start in January or February and are complete by April or May, after which the students are considered available for hiring. Students must be 18 before starting work. They earn high school credit for their work at the utility.

LEARNING THE ROPES

Interns are paid \$15 an hour. On their first day, the students meet in the administration building for onboarding and orientation. The internships include some online course work for which students are also paid. They receive safety, diversity, sexual harassment, IT and OSHA training.

Most of the training they receive is on the job. The students work with their supervisor and team. They work four-hour shifts, typically 8 a.m. to noon or 1 p.m. to 5 p.m. For the field operations jobs, the students learn how to maintain the water system, fix and install pipes, help with the pump line and pumping stations, and install water meters. They work with the water and wastewater staff.

For the customer service roles, students work in the administration building with the customer service team.

YOU'RE HIRED!

Several interns have been hired for full-time employment. In the first year, both field operations interns and one customer service intern were hired. "All three are still employed and two were promoted within seven months of being hired permanently," says Lovell. "They were thrilled."

Even students who were not hired or did not apply told Lovell the internship was a great experience; they said that it was beneficial to them and that they enjoyed it. They also came away with real-world experience to put on their resumes.

The internship programs received a 2022 National Environmental Achievement Award in the Workforce Development category from the National Association for Clean Water Agencies for resourceful employment and community outreach.

Says Lovell, "We think it's a great program and we will continue to use it going forward." **tpo**



Justin Barrow was a member of the 2022 internship class in field operations.

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A Quest for Excellence

LATIA JUTAN USED EXPERIENCE GAINED IN THE PUBLIC AND PRIVATE SECTORS AS FUEL FOR A RAPID RISE TO A LEADERSHIP ROLE IN THE CLEAN-WATER PROFESSION

STORY: **Jim Force**

PHOTOGRAPHY: **Jon Shapley**

Perhaps no one has gained more from experience than LaTia Jutan.

Taking advice from her mom, developing management skills in her own cleaning business and learning about wastewater treatment as an operator in training, Jutan rose to superintendent of the wastewater plants and lift stations in Baytown, Texas, in just 12 years.

In 2022, she received the William D. Hatfield Award from the Southeast Chapter of the Water Environment Association of Texas, recognized in particular for her work in asset management and preventive maintenance. Sterling Beaver, assistant director for public works and engineering, says Jutan is coachable and takes a professional approach to problem-solving.

“Before she got here, we did not have a good preventive maintenance program,” he says. “It was a different culture. But she and I have focused on PM, scheduling, budgeting our capital improvements and operations and developing long-term plans. She is open to suggestions and eager to improve herself and her team.”

GETTING STARTED

Jutan sees her mission as “bringing new and innovative ideas to the wastewater field and promoting positive upward change.”

Her working career started more modestly. After earning a degree in business management from Amridge University in her native Montgomery, Alabama, she got



LaTia Jutan, superintendent of the City of Baytown Wastewater Division, next to a clarifier at the Northeast Wastewater Treatment Plant.

a job working in a warehouse. But she wasn’t satisfied and, on advice from her mother who had experience working in the municipal field, she took an operator-in-training position with the City of Houston.

“I was familiar with hands-on work, and the position suited me,” she says. She saw the job as an opportu-

“ I’m passionate about what we do.
I want us to be great.”

LATIA JUTAN



A TEAM FOR TREATMENT

A wastewater collections system of 471 miles of sewers and 86 lift stations serves Baytown’s 80,000 residents.

The city’s four wastewater treatment plants — Central District, East District, Northeast and West District — are designed to treat a total design dry-weather flow of 24.2 mgd.

The Central District facility, on 4.8 acres site bordering the Goose Creek and Goose Lake inlet waterway leading to the Galveston Bay, is designed for 6.2 mgd and a two-hour peak wet-weather flow of 34 mgd.

The East District plant (6.0 mg, 31.5 mg two-hour peak) is on 8.5 acres bordering the Cedar Bayou of the Trinity San Jacinto tidal basin. The Northeast District Plant (4.0 mgd design, 20 mg two-hour peak) is on 14 acres bordering the same waters. The West District plant was recently expanded to 8.0 mgd (40 mgd peak).

Except for the Central facility, the plants are designed similarly. They use a bar screen and grit removal system (Ovivo), followed by activated sludge, clarifiers, disinfection and biosolids digestion. The Central plant features a complete mix process.

LaTia Jutan, superintendent of wastewater, leads a department with 36 full-time team members, including operations, maintenance, electrical/instrumentation, laboratory and management.

LaTia Jutan
Baytown, Texas



POSITION:
Superintendent of Wastewater

RESPONSIBILITIES:
Manage four wastewater treatment plants, 86 lift stations

EXPERIENCE:
12 years in wastewater treatment; five years in private business ownership

EDUCATION:
Bachelor’s degree, business management, Amridge University; master’s degree, public administration, Ashford University

CERTIFICATIONS:
Class A Wastewater Operator; Certified Public Manager, University of Houston

AWARDS:
2022 William D. Hatfield Award, Southeast Chapter, WEA of Texas

GOALS:
Advance to assistant director for Baytown, build a legacy of accomplishment



The team at the Northeast Wastewater Treatment Plant, includes, from left, Angel Negron, lead operator; Alejandra Moz, lab technician; Jessica Gutierrez, operator II; LaTia Jutan, wastewater superintendent; Kathryne Mathis, lab technician; Eldon Derrington, operator II; Dynnne Mitchell, field supervisor; and Grace Wright, chief lab technician.

nity to become educated in the wastewater profession and start a career: “I was motivated. I thought, ‘This is my niche.’”

She earned her certification in 2009, and the plant where she was working received a Peak Performance Platinum Award from the National Association of Clean Water Agencies. She was proud to be part of an operation that reported no effluent permit violations.

She moved up quickly, earning her Class D and C certifications within the first year. After that, she was promoted to inspector in the wastewater department where her responsibilities included reviewing treatment processes, making them operate more efficiently while maintaining the required water quality.

But as important as the position was, it offered none of the management upside that Jutan was looking for. “It wasn’t a family,” she explains. “There was no advancement beyond the inspector position, no way to move up.”

TO THE PRIVATE SIDE

So, she decided to give the private sector a try and test her management skills. In the middle of Houston’s oil and gas industry, she started an industrial cleaning business, focusing on the petroleum sector.

While she stayed with the business for just over two years, she found the experience valuable, enabling her to train team members and focus on customer satisfaction. “We had several offsite crews,” she says. “I was

able to develop management expertise. We had a service we were proud of, and we focused on whether our customers were happy or not. It not only taught me how to run a business, but what different people needed and how to accommodate that.”

Her passion for excellence was nurtured there, too: “It taught me what our customers needed and what our competition was doing. I was able to mentor each employee and enable them to get better, buy into our goals and ultimately to become great.”

She returned to the wastewater profession, serving in Houston for three years while running her cleaning business at night. As if not busy enough, she received a master’s degree in public administration from Ashford University. Then, with a host of superintendents and assistants retiring at the Baytown utility, she joined that city’s team as an operator and was quickly promoted to wastewater coordinator, and then superintendent.

MAKING A DIFFERENCE

She immediately prepared to lead a complete overhaul of the wastewater department’s preventive maintenance program, while focusing on what she calls the “Competency Model”: “It refers to gaps in training. People learn in different ways and it varies from person to person. I didn’t believe a blanket approach was the best way to go.

“There are different ways of learning, depending on the individual.”

She says that too often managers tell employees how something works but without fully explaining the important operating details to them. “As a result, employees develop their own ways of operating or maintaining a piece of equipment, and it’s not always operated as intended. Errors occur and things are missed.

The solution is to make sure everyone understands a particular process. She recommends small, standardized tests that everyone takes so that all equipment and operating procedures are understood universally. “Start at

“LaTia is open to suggestions and eager to improve herself and her team.”
STERLING BEAVER



LaTia Jutan received the 2022 William D. Hatfield Award from the Southeast Chapter of the Water Environment Association of Texas.

“We developed an SOP for everything. And we created a preventive maintenance book that we updated daily.

LATIA JUTAN

the lowest level,” she says. She finds standard operating procedures on video to be an innovative and effective training approach.

MANAGING ASSETS

Some challenges she faced came from outside forces. “Because of Hurricane Harvey (2017), we lost some of the O&M manuals,” she says. Her staff had to research equipment, re-create the documents and put them all on the networks.

“We developed an SOP for everything,” she says. “And we created a preventive maintenance book that we updated daily. We wanted to be proactive, not reactive, so we’ve developed O&M spreadsheets that include on-site as well as warehouse replacement parts and supply chain information.”

Baytown has also adopted Cityworks public asset management software to inventory all plants and assets and document life expectancy. The program has improved the ability to manage and plan. The program contains a work order system that lays out everything her crew needs to do to keep Baytown’s plants and lift stations running smoothly.

“It builds on what we have and contains everything we need to do,” she says. “We are building a program that withstands staff turnover.”

MANAGEMENT SKILL

Jutan’s ability to manage a broad range of assets and a large team can be traced to her business experience. At least that’s the opinion of Sterling Beaver, her manager. “Running a business requires that you juggle different tasks simultaneously,” he says. “It has similarity to her current role.

“She has 30-plus people reporting to her, plus she manages four treatment plants and 86 lift stations and must be able to keep track of operations and maintenance and a budget of several million dollars.”

In Jutan’s view, it’s a quest for excellence. Just as she’s shared her company’s mission with her team, she wants her colleagues at Baytown to embrace greatness. “I’m passionate about what we do,” she says. “I want us to be great.”

She refers to team-building as pouring information and inspiration into her staff. “It’s getting everyone to see the whole picture,” she says. “It’s training, motivation, identifying problems and working together to solve them.”

She sees her work and that of her team as building a legacy: “It’s how we carry ourselves, and it’s not just management; it’s out in the field as well. This is not just a job. There’s no new water. What we do keeps our water and our community safe for our kids, grandkids and neighbors. We want to leave something behind, so that when we leave here, we can say, ‘This is what we did.’” **tpo**



Jutan credits her private-sector business experience for her ability to manage a broad range of assets and a large team.

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1



2

Moving Water Efficiently

PUMPS WITH PERMANENT MAGNET MOTORS AND VFDs DELIVER ATTRACTIVE RETURN ON INVESTMENT IN HIGH-DUTY-CYCLE APPLICATIONS

By Ted J. Rulseh

High-efficiency equipment has become a focal point in the clean-water and drinking water sectors as utility leaders strive to be better stewards of energy and water resources.

That focus extends to the pumping systems that move wastewater through collection systems and into treatment processes, and that draw drinking water from wells and reservoirs and fill the tanks and towers that hold water for distribution.

The objective is to create pumping systems that deliver financial savings while performing reliably and intelligently, providing long service life, and saving on maintenance. Toward these ends, pump manufacturer Franklin Electric offers high-efficiency submersible pumping systems built around the company's MagForce permanent magnet motors.

The company cites PM motors as a proven technology used in applications from industrial to residential. PM motors have rotors made with rare earth magnets that perform with no slip. Because the rotors require no electricity to become magnetized, the motors are more efficient.

The savings on energy can quickly offset the higher initial costs. For example, motors with a 94% efficiency rating can provide a payback of less than two years in long or continuous duty applications.

Brandon Schumm, product manager for large submersible motors with Franklin Electric, talked about the technology in an interview with *Treatment Plant Operator*.

tpo: What was the market impetus for this type of pumping system?

Schumm: We had customers with high-duty-cycle applications running 24/7 or very close to that. They understood that if there was a way to get better efficiency out of the pump or motor, they could save on operating costs. PM motors were not new to the world, so we looked into that technol-

ogy and incorporated it into submersible motors. The pump is still the same. The difference is the high-efficiency motor we've added to the system.

tpo: Was there any particular challenge to marrying PM motors to submersible pumps?

Schumm: The design was a little tricky because we're confined to a certain diameter in submersible applications. In aboveground settings with a PM motor, you can change the geometry and get bigger, wider and longer. But working within a limited diameter for going down a well does pose a few design challenges.

tpo: Is the efficiency advantage due to the use of the rare earth magnets?

Schumm: Yes. With traditional induction motors, you have to add energy as electricity to make that internal magnet. With PM motors, you eliminate that added energy because the magnet is already there.

tpo: Where would these high-efficiency pumps typically be found in drinking water or wastewater treatment plants?

Schumm: Municipal drinking water plants are our main focus, but these motors could be used in any high-duty-cycle application. PM motors are more expensive than induction motors, and you have to overcome that up-front cost. If you have an application where a pump is running 30-40% of the time or more, that's a good opportunity to look at this solution.

tpo: How much more efficient are pumps with PM motors versus induction motors?

Schumm: It depends on the size of the pump, but anywhere from 8 to 12 percentage points more efficient. So where an induction motor might be

82-83% efficient, pumps with these high-efficiency motors can get into the low to mid-90s.

tpo: Beyond energy efficiency, what advantages do these pumps have?

Schumm: Because you're pulling less current for the system, you can look at downsizing other components. In wire sizing, for example, in the past you might have used a 6-gauge wire. Now, because the motor is pulling less current, you can use a smaller-gauge wire. You might even be able to downsize the variable-frequency drive or the filtering. Another benefit is the capacity for higher speed. Based on the frequency coming in, which in our market is 60 Hz, pumps and motors spin at about 3,450 rpm due to the slip that's inherent with an induction motor where you have to create that internal magnet. With the magnet already present in the PM motors, you can get up to 3,600 rpm. We consider that a boost in performance.

tpo: Are there any benefits related to size or configuration?

Schumm: In some systems we can reduce the weight and the length by almost half. I was on an install recently where a customer was using one of our 250 hp motors. When the technician, who was rather short, went to bolt the motor to the pump, he said, "This is the first time I've been able to reach the bolts and not have to use a ladder."

tpo: How do you relate the efficiency of these pumps to prospective customers?

Schumm: Many municipalities have had visits from energy consultants, and the first thing they do is look at the ceiling and say, "If you want to save energy, change all your lighting to high-efficiency LEDs." So to better relate, we created a calculator showing that if you were to switch to a high-efficiency MagForce motor, it's equivalent to replacing X number of light-bulbs with LEDs. The calculator can also show reduced carbon footprint.

tpo: What role do VFDs play in these high-efficiency pumping systems?

Schumm: You must use a variable frequency drive with this type of motor. When you go to start up the motor, you have to know the phase alignment. If you just applied energy over the line without a VFD in place, the motor would lock itself up. You need a VFD to get it spinning and to have that phase alignment when it is operating.

“Municipal drinking water plants are our main focus, but these motors could be used in any high-duty-cycle application.”

BRANDON SCHUMM

tpo: Can you cite an example of an application where these pumps proved beneficial?

Schumm: A municipality in Germany was using an induction-motor-driven pump over the line. To get the correct flow, they would throttle the flow out of the pump. The motor was spinning all the time and they were essentially restricting it so as not to produce more flow than they needed. We set them up with a high-efficiency system with a VFD. They were able to downsize the pump, and with the VFD they could vary the speed depending on the flow requirement. We cut the power consumption in half. We attributed about 80% of the savings to the VFD, and the other 20% to the PM motor.

tpo: What is the size range for this line of motors?

Schumm: We run the whole gamut. We start out at 1.5 hp and go clear up to 300 hp. Our 8-inch and 10-inch designs are where we see municipal and industrial applications going. The 8-inch motors range from 75 to 175 hp, and 10-inch units from 250 to 300 hp. **tpo**

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Lead in Pipes: It's Go Time

THE INFRASTRUCTURE LAW HAS MADE FUNDING AVAILABLE FOR LEAD SERVICE LINE REMOVAL. IT'S TIME TO MAKE PLANS AND TAKE ACTION.

By Ted J. Rulseh

It's no secret that exposure to lead in drinking water can have serious effects on health, especially in children. The most effective solution to that problem is to remove all lead pipes, fixtures and solders from drinking water distribution systems.

That includes removing and replacing lead-containing service lines to homes, businesses and schools from the water main all the way to the building. Doing this will require substantial planning, funding, community outreach and political will.

A white paper from Milhouse Engineering and Construction, a company that manages infrastructure programs for industries including water and wastewater, argues that replacing lead services with modern infrastructure should be a top priority. The paper cites U.S. EPA estimates that up to 10 million homes and 400,000 schools and child care centers have drinking water service lines or fixtures that contain lead.

"In the United States, we have the financial means and the technology to remove lead drinking water service lines," the paper states. "What's needed now are leaders to ensure it is prioritized and done with urgency to protect the health of our current and future generations."

James Fifer, vice president of program management, and Mark Kilkelly, director of program management for the Northeast U.S., shared perspectives on the problem of lead in drinking water, and the challenges to full resolution, in an interview with *Treatment Plant Operator*.

tpo: Why does it seem that progress on lead service line abatement has been slow in many places?

Fifer: From what we've been able to see, it's a logistical issue. There needs to be funding in place, and community staff and elected officials need to be working in the same direction. In municipalities where that happens, they have been able to attack the problem pretty quickly.

tpo: What are the critical challenges to lead service line removal?

Kilkelly: The actual physical replacement of lead services is not really a challenge. It's exactly the same as replacing any type of service. You run into the challenge on the administrative side and with permitting requirements and related issues. The lead service from the main at some point crosses a line onto the homeowner's property. The challenge for a utility is to remove the lead in its entirety. Partial replacement is not an option because that can temporarily elevate the level of lead in the water.

tpo: How can partial removal of the service increase the water's lead content?

Kilkelly: Some lead services were installed up to 100 years ago. Over

time, services may build up a coating inside the pipe. That can create a natural barrier that reduces the amount of

lead getting into the water. When you cut or bend or twist the line, you disturb that coating and expose fresh lead to the water. That along with galvanic corrosion can elevate the level of lead until the coating is restored.

tpo: What are some ways of enabling the removal of the services from the main all the way to the house?

Fifer: Some municipalities pass legislation to change the ownership structure, so that the utility owns the service up to the property owners' houses. Then they can do the entire replacement. Another way is to get consent from the homeowners to do it, but that's where it starts to become problematic. Getting consent from every homeowner on a street is difficult. If you don't get everyone, you're faced with replacing some services and not others. You want to cut into a street only one time, restore it and be done. Having to come back later is expensive and inconvenient, and residents don't like it.

tpo: How can replacement of the property owners' section of service be made affordable?

Fifer: There's a lot of funding available now, and there are different ways of packaging it to make removal affordable or in a lot of cases free for home-



James Fifer



Mark Kilkelly

“The infrastructure law allocated \$55 billion to clean drinking water for households, and \$15 billion of that has been earmarked for the lead services.”

MARK KILKELLY

owners. Each municipality has to build a financial structure based on grants or loans. You need people who are very aware of the latest funding options and who can capture enough to cover what is required.

tpo: What is the role of the bipartisan infrastructure law in lead service line abatement?

Kilkelly: The infrastructure law allocated \$55 billion to clean drinking water for households, and \$15 billion of that has been earmarked for lead services. The keywords are that this funding is available. It hasn't been specifically allocated house by house. It is available for utilities to go after to fund their programs. How they structure their programs may vary, but they need to actually go and acquire the funds.

tpo: What is involved in pursuing and acquiring this funding?

Kilkelly: Many utilities and mayor’s offices are familiar with going after these kinds of dollars. They have existing avenues, and they may have creative ways of acquiring funding. On the website for the infrastructure law there is guidance on how to pursue the funds for lead service removal. The tools are there for anyone to use.

Fifer: Companies like ours work with funding experts who understand how to access this money in the most efficient and best way for a given municipality.

tpo: How would you assess the social equity aspects of removing lead-containing services?

Fifer: It varies by community. In many places the highest concentrations of lead services are in lower-income or minority communities. So there is an opportunity to facilitate social justice by first attacking the problem where the people who need it most live. People with higher incomes have other options. They can get filters, or they can buy bottled water. But people who don’t have the ability to purchase those things are left with what comes out of the tap. If that isn’t healthy, that’s not a good situation.

tpo: What is the typical range of costs to replace a lead service?

Kilkelly: In a typical urban situation, it can range from \$1,100 to \$9,000. There are a huge number of influences on that cost. They include the presence or absence of sidewalks, landscaping, retaining walls and other features. It’s not really the utility or the state, it’s the characteristics of each house that influence the cost.

tpo: Once funding and permitting are in place, what does it take to complete the job of lead service removal?

Kilkelly: Replacing a lead pipe is just like replacing any standard service. There are no new challenges. Once you have the permit and the project design, you hire a contractor, and they get out and do the job. It typically takes half a day between setup and excavating. The hard work is in terms of the funding, coordinating with the homeowners and establishing the program.

tpo: Is there also a component of coordinating with other public and private entities in a community?

Fifer: Yes. You want to make sure that you aren’t undertaking the replacement program in a vacuum. You need to consider other capital programs that may be going on for infrastructure. Is there a gas service being replaced in the area? Are there electric upgrades? Is there fiber optic cable installation going on? You don’t want to do service replacement right before or after any of those. You want to coordinate so that you open the street one time and do the restoration one time.

tpo: How do you see progress on this front now that federal money for service replacement is readily available?

Kilkelly: Current legislation requires all water utilities to compile a database of their lead services. The EPA has provided the tools to help them carry out that work. Each part of the country and each municipality are at different stages, but the EPA and the government as a whole are pushing through and enforcing the early steps to get programs rolling countrywide.

tpo: What is the role of private companies in these initiatives?

Fifer: One thing private companies can offer is program management. Many municipalities will establish a program to coordinate design, permitting, contract awards and construction management — everything required to go from, yes we want to do this, to having the program complete. Private companies can offer that service to shepherd clients through the process.

“In many places the highest concentrations of lead services are in lower-income or minority communities. So there is an opportunity to facilitate social justice by attacking the problem where the people who need it most live.”

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tpo: Do you find that this kind of assistance can accelerate progress?

Fifer: I believe so. For small communities that haven’t done this, there is a lot to learn. A private company brings experts who have experience and understand how to get it done. That can help expedite the process.

tpo: What advice would you give to utilities about moving forward with lead line replacement?

Fifer: It’s about recognizing that now is the time. This is a unique period when there is a great amount of funding available. This is the time to make it a priority and say, “We’re going to do this. We’re going to get the necessary funding, put a program manager in place, and get the ball rolling.” Those who do that are going to be much farther ahead. Those who don’t jump on it now may look up later and discover that the funding is no longer there. **tpo**

exam STUDY GUIDE

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Students use a school garden to learn about the water cycle, water conservation and Florida-Friendly Landscaping practices.

Making a Splash

A FLORIDA WATER MANAGEMENT DISTRICT HAS MADE A SUBSTANTIAL IMPACT ON STUDENTS AND EDUCATORS WITH ITS GRANT PROGRAM FOR 25 YEARS

By Sandra Buettner

A water management district's *Splash!* School Grant Program has benefited more than 60,000 students from 12 counties in the past 10 years.

The Southwest Florida Water Management District created the program to equip educators with freshwater education resources for K-12 public and charter schools.

The district, with offices in Brooksville, Tampa, Sarasota and Bartow, covers 10,000 square miles in all or part of 16 counties and serves a population of about 6 million. Its mission is to protect water resources, minimize flood risks and ensure that the public's water needs are met.

DIVERSE ACTIVITIES

Grants can cover a wide range of activities. "There are so many choices listed on our website, but one of the most popular seems to be field trips," said Katherine Munson, senior communications coordinator. On those trips, kids see their local waterways firsthand.

One popular activity is creating and observing a water conservation project right at the schools such as planting a garden using hydroponics. "One of the more unique activities was a puppet show written and created by students on the water cycle," Munson says. "The students invited the parents to the production, and it was a big hit with them."

The program is promoted through the district's website and through social media. The district has an email list of 3,000 educators and science coordinators. Every year emails remind them about the grants available.

IN BIG DEMAND

Applications for grants run from July through September. Teachers apply online and work on applications during summer or shortly after the start of the school year in mid-August. Because so many applications are submitted, a lottery system is used to narrow the field. The selected projects are reviewed, and on average about 60 grants are awarded each year.

Grants provide up to \$3,000 per project per school year (mid-August to mid-May). The grant money comes via funds from ad valorem tax dollars collected throughout the district's 16 counties. School districts with larger populations get proportionately more grants.

Over the past 20 years, more than 2,040 grants have been awarded, totaling more than \$4 million. Most teachers who apply are STEM educators, but the district also gets submissions from agriculture and English teachers.

IDEAS AND ACTIVITIES

Some activities eligible for grants include:

- Using a model to observe the water cycle process
- Writing a book or play following a water drop through the water cycle
- Inviting a guest presenter to lead students in a hands-on demonstration
- Going on field trips to explore a local freshwater or estuarine ecosystem
- Water-quality testing

GETTING RESULTS

Educators applying for grants must complete an application that details how they will use the money and what items they will need.

Grant-funded projects require a pretest and post-test for the students. The district website provides some sample questions, but teachers are responsible for creating the tests, which measure how much the students have absorbed and learned.

Melissa Gulvin, the district's communications manager, observes, "Teachers report the knowledge gain for their classes, which program-wide has



Preparation of a hydroponic grow tower is part of some students' water-conserving garden projects.

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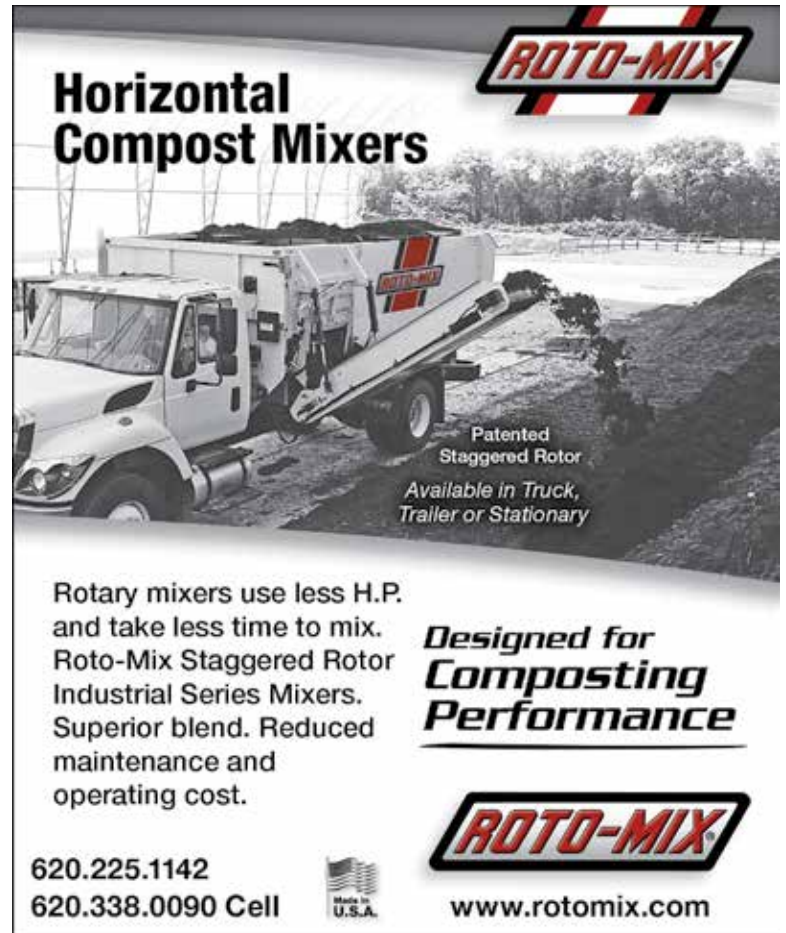


High school students analyze water samples they collected from Tampa Bay during a field study program with the Tampa Bay Watch.

averaged 32% over the past 10 years. The information from the testing also helps the district justify continuing the grant program.”

The students use what they learn to remind each other and family members about adopting more water-conserving responsible behaviors. Parents may receive flyers about the project their children are working on or can be part of an at-home activity.

Says Munson, “One of the biggest comments we hear from the teachers is that this is the first time most of their students have visited their local waterway, even though here in Florida we are surrounded by water and wetlands.” tpo



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Fighting Off the Freeze

HEAT TRACE CABLES PROVIDE A RELIABLE SOLUTION TO KEEP CLEAN-WATER PLANTS OPERATING AND IN COMPLIANCE IN SPITE OF WINTER'S SEVERE COLD

By Kevin Green

Water scarcity in the United States and worldwide makes reliability in wastewater treatment plants all the more urgent.

Cold weather poses serious challenges to treatment plants. In particular, freezing temperatures can jeopardize the piping infrastructures that enable plants to produce clean water. Piping systems are like a plant's circulatory system.

Damage to one pipe can lead to a cascading effect on the entire infrastructure. Given the complexity of treatment systems, the isolation and repair or replacement of a single damaged pipe can require an expensive, time-consuming shutdown of machinery.

Today, thanks to modern-day freeze protection technologies, such as heat trace cables, treatment plants have ways to safeguard mission-critical pipelines and other components against severe cold-weather events.

WINTER CHALLENGES

As challenging as the variables of wastewater treatment can be, winter weather makes operations even more demanding for plant supervisors and technicians. Snow, ice and freezing rain can create obstacles that keep a plant from running at peak performance.

Cold temperatures slow down the activity of microorganisms that do the work of breaking down contaminants. It also can lead to frozen and cracked pipes, hoses, valves, pumps and process components as well as ice formation on outside tanks and reservoirs.

If left unprotected, almost any plant machine or component can freeze. Once that happens, the plant may need to be partially or completely shut down for repairs. Then wastewater must be stored until the facility restarts, or released partly or fully untreated, leading to environmental contamination, fines for permit violations and bad publicity.

A major cause of extended downtime is waiting for vital replacement parts. Besides cracks and flooding, limited freezing of water or vapors in pipes can lead to changes in system conditions that render treatment less effective and less efficient.

THE NEED FOR PROTECTION

As much as two-thirds of capital expenditures for wastewater treatment plants can go toward pipelines and pumping stations.¹ Given this investment, extra measures are required to keep processes performing optimally during cold weather.

When pipelines freeze, the consequences are severe. Leaks and bursts pose a danger to staff safety, the environment, and the plant's financial status and reputation. A recent example is the historic 2021 winter storm in Texas. The brutal cold engulfed vast swaths of the Southwest, shuttering water treatment facilities and hindering repairs.



PHOTOS COURTESY OF EMERSON

Heat trace cable can be attached using fiberglass tape. Cable should be looped around valves, hangers, and other small devices so that they can be accessed without cutting the cable.

To ensure continuous treatment during the winter, freeze protection is essential. Electric heat trace cables can play a major role, offering reliable, safe and energy-efficient performance.

Damages at Texas plants included broken pipes, valves and basins, and impacts to chemical feed systems. This led to service disruptions for water systems in more than 140 counties, affecting some 14.9 million people at the storm's peak.

A PROVEN SOLUTION

To ensure continuous treatment during the winter, freeze protection is essential. Electric heat trace cables can play a major role, offering reliable, safe and energy-efficient performance.

Heat tracing cables prevent pipes from freezing by use of a resistive element that heats up when electricity passes through. This keeps the pipe and liquid inside at a constant temperature. Self-regulating cables automatically adjust the heat output in response to temperature changes, increasing the heat output as pipe cools and decreasing output where the temperature is rising.

Treatment plant areas that benefit from heat tracing include the headworks, supply pump stations, influent lift stations, filtration systems and outdoor chemical feed systems. Other areas that should be considered include stairs and walkways, loading docks, and platforms to ensure team members' safety. Faucets and washdown equipment exposed to cold may also need protection. Generally, reactors and digesters have enough mass to prevent freezing.

HOW THEY WORK

Self-regulating heat trace cables have been proven for more than 30 years in the hydrocarbon and chemical industries. They provide a conductive ground path when installed on nonconductive surfaces, such as plastic or painted pipe.

The heater cable derives its self-regulating characteristic from the inherent properties of the conductive core material. As the core material temperature increases, the number of conductive paths in the core material decreases, automatically decreasing the heat output.

As the temperature decreases, the number of conductive paths increases, causing the heat output to increase. This occurs at every point along the length of the cable, adjusting the power output to the varying conditions along the pipe. Because the cable is self-regulating, it can be overlapped where the installation requires, without creating hot spots or burn out.

DESIGNING THE SOLUTION

When specifying heat trace cable, it is important to establish parameters, which are determined by pipe sizes and lengths, material, number of attached valves and pumps, and the type of pipe supports. Other factors are the supply voltage, weather data for the area, and the minimum startup temperature.

Some treatment processes can release flammable gases and vapors, such as from oils, solvents or gasoline from accidental spills, and biogas from anaerobic digestion. In confined spaces, high concentration of gases can build up, creating the risk of explosion triggered by an electrical arc.

The *NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities* 2020 edition specifies that most pumping stations, spaces and buildings that make up a wastewater treatment plant must be considered hazardous locations.

Therefore, in North America, heat trace cable should be rated for hazardous locations as defined in Article 500 of the National Electrical Code. Heat tracing cable solutions for wastewater applications in Europe should be certified to ATEX, IECEx, CENELEC, EU or other regional hazardous location standards for metal and nonmetal pipes, tanks and vessels.

A cutaway shows the structure of heat trace cable.

INSTALLING CABLES

Before installing heat trace cable, users should consult the manufacturer's specific instructions. Failure to do so will likely void warranties and agency approvals. The integrity of the system depends on how accurately the heat trace cable is installed. Improperly installed systems have resulted in system failures and physical injuries.

In general, heat trace cables can be installed in straight runs (found to be the more standard protocol) or spiraled around the pipe. Spiraling is used when a limited number of cable types are available; the practice has become less common in recent years. In straight tracing, the cable is installed on the lower quadrant of the pipe to prevent damage from falling objects or from being walked on. In either approach, the cable should be applied flat to the pipe.

The cable can be attached using fiberglass tape. The cable should fit snugly against the pipe and should be secured every 12 inches. Metal straps, wire, vinyl electrical tape and duct tape should not be used for attachment.

If the cable must be cut, that should be done after it is attached to the pipe, and after confirming allowances for terminations, connections and heat sinks. Cable should be looped around valves, hangers and other small in-line devices so that they can be accessed or removed without cutting the cable.

Moisture penetration of the heat trace system is the single largest source of problems. Particular care must be given to the proper sealing of all electrical connections and splices. Cable sealing kits provide a proper seal for the cable itself. Other electrical connections, including heater to power wir-

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ing, thermostat connections, and panel and breaker connections, should be sealed or moisture-proofed in an approved fashion.

After installation, it is important to periodically inspect the cable and system components for damage, ensuring that the cables are free of nicks, tears or gouges. The inspection also should verify that additional cable has been installed at each valve, flange, pipe support and other devices to allow easy access. Connections, splices and end-seals must meet code requirements.

THERMOSTATS AND CONTROLLERS

Heat tracing requires temperature control. When selecting the proper thermostat or controller, it is necessary to consider the devices' voltage and amperage ratings, as well as the suitability of their housings for the environment, specifically ensuring that the enclosures are explosion-proof, watertight and corrosion-resistant.

Heat tracing cable can have benefits beyond freeze protection. Many chemicals used in wastewater treatment, such as ferric chloride, sulfates and polymers, are aggressive and require process temperature maintenance, a task for which heating trace cable is well suited.

Wastewater treatment is one of the most important environmental processes. During colder months, heat trace cables help maintain efficient system performance and counter seasonal upsets by keeping water and chemicals flowing. This helps prevent facility flooding, the expense of replacement parts and repairs, environmental damage and plant downtime.

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^[1] *Reducing the Costs of Water and Wastewater Treatment Pipelines*, April 2, 2021, Fluence

ABOUT THE AUTHOR

Kevin Green (kevin.green@emerson.com) is national sales manager for Nelson Heat Trace, Emerson. **tpo**

Eye on Performance

A TREATMENT PLANT TEAM IN A NEW YORK VILLAGE SAVES TIME AND IMPROVES OPERATIONS WITH A DIGITAL DATA MANAGEMENT SOLUTION

By Scott Dorner

Monitoring the treatment of wastewater from influent to effluent was a persistent challenge for the team at the Penn Yan (New York) Wastewater Treatment Plant.

Operators received data on pH, dissolved oxygen, suspended solids, temperature and other parameters from instruments, and also gathered results from samples sent to laboratories. They used paper bench sheets later entered into an Excel spreadsheet for performance tracking.

All the lab results, instrument readings and bench sheets were manually entered into spreadsheets for different purposes. The manual data entry was time-consuming and prone to errors. In addition, having data stored in different spreadsheets wasn't optimal for understanding the performance of the system as a whole.

"We were chasing data all over the place in multiple spreadsheets, which made it very hard to troubleshoot issues and difficult to see long-term trends," says Yvonne Tucker, chief operator.

Penn Yan solved those problems in 2022 by moving from paper to a digital solution. The Rio software program from Aquatic Informatics now helps the team manage plant operations by collecting and organizing data into actionable insights.

GUARDING RESOURCES

Penn Yan (population 5,000) lies on the north end of Keuka Lake in the heart of the Finger Lakes region of New York. The Keuka Lake Outlet carries water through the village along with two small creeks to Seneca Lake, the largest lake in the Finger Lakes chain.

These waterways and the power they generated were a principal reason for the establishment of the village in 1799. Today, residents and summer vacationers enjoy many recreational activities along the lakes and the outlet. Protecting those waterways is a top priority for the Penn Yan treatment plant operations team.

The wastewater treatment plant was built in 1983 with a design flow of 1.8 mgd. During heavy rain events, flows can increase from the average 1.2 mgd to as much as 5.6 mgd in less than 30 minutes. The secondary treatment process is comprised of 16 rotating biological contactors. Nitrification takes place on the last 10 RBCs, and polyaluminum chloride is used to reduce total phosphorus to less than 1 mg/L.

On the solids side, anaerobic digestion is followed by mechanical screw press dewatering and biosolids compost production. While industrial users account for only about 10% of the plant's flow, periodic spikes can cause overloading that upsets the treatment process.

The new software helps the plant team respond more effectively to such upsets and other conditions. Among its capabilities, it can integrate with electronic lab transfers, pull data from instruments, and allow personnel to capture field data with a connected mobile device. Operators can receive notifications by way of an app or email if a parameter setpoint has been exceeded.

Having all the data securely stored in the cloud improves operational visibility. Before and after weekends and holidays, operators let their co-



Yvonne Tucker, chief wastewater treatment plant operator



Rotating biological contactors provide secondary treatment at the Penn Yan facility.

workers know if something is amiss, but at times circumstances don't allow those conversations to happen. With information from the previous shift at their fingertips, the new crew can have a quick glance at recent events.

DATA FOR TROUBLESHOOTING

Like most treatment plants, Penn Yan has redundancy at its pump stations. Evening out pump runtimes ensure that maintenance is performed when needed. A deviation in runtimes can indicate a problem.

"We recently installed a new pump station and began to notice that one of the pumps was accumulating more hours than the other," Tucker reports. "On investigation, our team found that the T-joint on the pipe had come

apart, so when that pump was on, water was coming back into the wet well, and it had to pump longer than the other one. By monitoring and trending pump hours in Rio, we were able to identify the problem.

“We can now be more predictive. We can avoid some problems and investigate others quickly and easily, so we can improve our response time to fix them in the future.”

A single data platform gives operators a much better understanding of performance and whether changes need to be made to keep the treatment process working efficiently. For example, if the load cells for the RBCs on only one of the two trains should show a trending increase in weight, that would indicate an uneven flow or loading condition.

That in turn would require an adjustment to the splitter box ahead of the RBC process to balance the distribution between the two trains. Continued uneven distribution could reduce treatment efficiency or increase stress on the mechanical equipment, possibly leading to a catastrophic failure.

For another example, a leading indicator of a healthy anaerobic digester is the ratio of volatile fatty acids to alkalinity. The Penn Yan plant operates at a ratio around 0.12. A change in the pH can cause the bacteria to stop functioning, leading to a sour digester and possibly foaming issues. “Using Rio we can watch this ratio trend closely and adjust how much we are feeding the digester, or add alkalinity to buffer the acid if needed,” Tucker says.

VISUAL ANALYSIS

As a relatively small treatment plant, Penn Yan monitors about 75 parameters from regulatory influent/effluent measurements to process control data. The new platform allows Tucker to select and analyze any number of parameters over any period.

Previously, she had to pull data from multiple spreadsheets to compile reports. Now, with a few clicks, she can create graphs and dashboards to visualize trends or identify relationships between any number of parameters: “We can create the graphs we need, on-demand, 10 times faster now. It’s a huge time-saving feature.”

As summer approaches, the village’s population swells, and organic loading to the plant increases, often leading to higher sludge blanket levels. Now, Rio can alert operators with warning level limits set in advance. Historical data can be easily trended and operational strategies to handle the higher sludge blankets can be quickly implemented.

“We can now be more predictive. We can avoid some problems and investigate others quickly and easily.”

YVONNE TUCKER

REPORTING AND COMPLIANCE

Tucker uses the software to produce monthly discharge reports and other quarterly reports. Since most data is automatically fed into the system, compliance reporting takes far less time, and without repetitive data entry there is less chance for error. Having all the data in one place adds a layer of defensibility to reporting and is also helpful when a permit exceedance occurs.

In that event, the village needs to follow protocols that start with notifying the Department of Environmental Conservation. “The next step is to understand why we had a violation, so we go through the plant looking for problems,” Tucker says.

“We check the operation of chemical metering pumps and make sure we are adding enough chemicals to help with settling. We compare the industry flow to see if their contribution is causing a negative impact. We look at what is in the influent and check to ensure that the flow did not exceed the design parameters of the tank, and so on.

“We can easily see the whole process. We can overlap data to compare time periods and determine what happened so we can get back into compliance.”

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CAPTURING HISTORY

In the days of manual data analysis, a stakeholder who wanted to see the last year of flow data would need to pull data from 12 spreadsheets and copy and paste it into one, a time-consuming job that might or might not yield any valuable insight. Today, Tucker can select and organize the data she needs for almost any request, providing transparency and enabling reports that visually showcase pertinent results.

New hires joining the team need to get up to speed quickly on plant operations; consolidated digital information helps that process significantly. And as things change over time, operators have a reliable historical baseline to help with decision-making.

Small communities with small budgets are held to the same standards and regulations as larger utilities, Tucker observes: “It’s vital for small teams like ours to use every tool we can to streamline operations and work processes as our roles and responsibilities often encompass a more diverse spectrum to those of our colleagues in larger utilities.”

ABOUT THE AUTHOR

Scott Dorner (scott.dorner@aquaticinformatics.com) is data management product manager for Aquatic Informatics. tpo

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Biosolids Management and Headworks

By Craig Mandli

Aftermarket Parts/Service

IEP TECHNOLOGIES ISODISC

The IsoDisc from IEP Technologies is an effective, self-actuating and self-resettable device providing explosion isolation to applications handling combustible dusts such as air aspiration inlets or clean air ducting to interconnected equipment. It is ATEX-certified and virtually maintenance free. 855-793-8407; www.ieptechnologies.com



IsoDisc from IEP Technologies

Belt Filter/Rotary Presses



C-Press screw press from Andritz Separation

ANDRITZ SEPARATION C-PRESS SCREW PRESS

The C-Press screw press from Andritz Separation provides high performance combined with compact design, and a low operating cost in the sludge dewatering process. With its direct drive system and conical shaft with constant screw pitch, it has a feed capacity ranging from 4 to 418 gpm, with an outlet capacity from 44 to 2,866 lbs/h. In addition to a long life cycle, the press also offers easy operation, low maintenance and reduced water consumption. The screw speed is automatically adjusted according to the input oscillation, ensuring a continuous flow with optimized performance in drying and capture rate, even during the washing phases. It complies with all regulations on such issues as safety, hygiene and environmental protection. 800-433-5161; www.andritz.com

BRIGHT TECHNOLOGIES, DIVISION OF SEBRIGHT PRODUCTS, 0.6-METER SKID-MOUNTED BELT FILTER PRESS

The compact 0.6-meter skid-mounted belt filter press from Bright Technologies, Division of Sebright Products, has stainless steel frame and roller construction as well as radius wedge zone and wing roller for sludge dewatering. Components include a sludge pump, polymer system and washwater booster pump. Options include a sludge flowmeter, air compressor and discharge conveyors. The compact walk-around skid design can be utilized in as little as a 10-by-20-foot floor area. The Boerger rotary lobe sludge pump has a maintain-in-place design offering ease of maintenance. Cake solids of up to 35% can be achieved. Rates of 25 to 50 gpm make it ideal for small applications or when a processor has outgrown dewatering containers. 800-253-0532; www.sebrightproducts.com



Belt filter press from Bright Technologies, Division of Sebright Products

CHARTER MACHINE ROYAL SCREW PRESS

Charter Machine's Royal Screw Press offers a small footprint and high efficiency design that has very low power consumption with a higher throughput. Using an integrated thickening drum, the system can concentrate feed solids up to 5% DS. The complete skidded system is ultra-quiet, large capacity and low maintenance. The removable wash-water nozzle ring travels, with its self-cleaning nozzles, laterally the length of the drum and gives a maximum clean with minimum amount of water. The sleek skidded design includes controls, drum thickener, sludge concentrator tank, sludge pump and screw press. 732-494-5350; www.chartermachine.com



Royal Screw Press from Charter Machine

Biosolids Handling/Hauling/Disposal/Application

BDP INDUSTRIES ROTARY DRUM THICKENER

The rotary drum thickener from BDP Industries is a suitable solution to thicken at water and wastewater treatment facilities. Internally baffled thickening zones lead to higher solids capture and higher throughput capability, all with reduced polymer usage. A full stainless steel construction with all bearings located outside of the enclosure makes operations and maintenance activities simple and easy. 518-796-1440; www.bdpindustries.com



Rotary drum thickener from BDP Industries



Electro-Osmosis Dehydrator from ELODE USA

ELODE USA ELECTRO-OSMOSIS DEHYDRATOR

An Electro-Osmosis Dehydrator from ELODE USA can reduce sludge disposal cost by 60% and landfill acceptable by having much drier sludge cake. This compact machine can easily retrofit in line with many existing presses. It uses the electrical potential difference in the sludge cake to separate water in the process and it

works on 95% of municipal cakes tested without any chemical, polymer, heat nor mechanical press. It can be used to turn 15 to 20% DS cake to 40 to 45% DS quickly. 201-568-7778; www.elodeusa.com

JDV EQUIPMENT LEVEL LODOR

The Level Lodor from JDV Equipment provides water quality professionals a means to dispose of processed waste, control odors and limit waste exposure to operators. It uses auto-leveling technology to level the waste material. This increases the fill percentage of a dumpster without operator intervention, slide gates or extensive control strategies, while limiting exposure to potentially hazardous material and working conditions. Made for indoor or outdoor use, it can save valuable indoor square footage or eliminate the need for additional building space by installing the system outdoors. The covers are custom made to cover standard 20-, 30- and 40-yard dumpsters, with an overall footprint barely larger than a standard dumpster. The shaftless option uses replaceable ultra-high molecular weight liners that will reduce screw wear. The shafted option can be used for increased efficiency and has easily accessible grease points. 973-366-6556; www.jdvequipment.com



Level Lodor from JDV Equipment

PAXXO LONGOPAC FILL

The Longopac Fill 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 90-meter-long continuous bag for odor containment and spillage control. The cassette bag can be sealed with ease, and the material and odors are trapped inside, cutting down development of bacteria and fungus spores. 770-502-0055; www.paxxo.com



Longopac Fill continuous bag system from Paxxo



FLUMP unmanned remote-control dredge from SRS Crisafulli

SRS CRISAFULLI FLUMP DREDGE

The FLUMP unmanned remote-control dredge from SRS Crisafulli removes biosolids and sediments. It is easy to use from a workstation or mobile phone, and easy to transport at approximately 6,000 pounds. It delivers lower operator

exposure to potentially hazardous materials, high performance with minimum turbidity, and faster operations with high-speed reverse and pivoting traverse systems. Its pumps are manufactured with an ASTM AR400 mild carbon steel (BHN 400 hardness) pump volute and impeller, and dual carbon/ceramic shaft seals. The pump is mounted directly behind the cutterhead and is lowered into the pond on the dredge's ladder. Standard, severe duty or custom models are available. 800-442-7867; www.crisafullipumps.com

Biosolids Heaters/Dryers/Thickeners



Non-Obstructing Heater from Hydro-Thermal

HYDRO-THERMAL NON-OBSTRUCTING HEATER

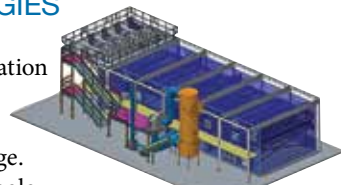
Hydro-Thermal's Non-Obstructing Heater is suitable for heating and maintaining the digester's precise temperature (+/- 1 degree F) for improving methane production and sludge stabilization. It also eliminates hot or cold spots in the digester, even

during the winter months. It utilizes a small footprint, with direct installation into the existing piping. It is produced using wear and corrosion-resistant metallurgies to withstand grit and highly abrasive materials. Its straight-through design can ensure that rags or wipes do not get caught and plug the heater. With its unrestricted flow there are minimal pressure drops, allowing for a wide range of heating capacity. The heaters have no hot surfaces where burn-on can begin to occur. 800-952-0121; www.hydro-thermal.com

800-952-0121; www.hydro-thermal.com

VEOLIA WATER TECHNOLOGIES BIOCON ERS

Rising concern of PFAS contamination of water and soil has sparked interest in this emerging contaminant as it pertains to wastewater sewage sludge. BioCon ERS from Veolia Water Technologies offers a safe and sustainable drying and combustion system for treating PFAS-laden municipal sludge. It combines the efficiencies of a convective air medium-temperature belt dryer with a biomass furnace, which uses the dryer output (dry product) as a biofuel. The heat available in the exhaust



BioCon ERS from Veolia Water Technologies

800-952-0121; www.hydro-thermal.com

is captured and used as process heat in the belt dryer. This integrated dryer and energy-recovery system is sustained by heat generated by the combustion of biosolids to drive the drying process, and in turn the dried material fuels the combustion system, making it a fully energy sufficient and sustainable operation. It combusts sludge between 1,400 and 1,800 degrees F, which is higher than the minimum temperature required for PFAS destruction. 919-677-8310; www.veoliawatertech.com

Centrifuges/Separators



Centrifugal Decanter from Pieralisi

PIERALISI CENTRIFUGAL DECANTER

Pieralisi offers a variety of high-efficiency solutions for sludge thickening and dewatering with significant environmental and economic advantages. The separation of liquid-solids occurs through the centrifugal force generated inside the

decanter, resulting from the high rotation speed. The decanter is equipped with a main motor connected to the horizontal axis of the bowl. The product is fed into the machine through a feeding tube. After the separation, the clarified liquid is discharged from one side of the bowl through devices sized according to the specific application, and the dehydrated cake, accumulated on the bowl walls, is transported by a scroll and discharged on the opposite side of the clarified liquid outlet. The decanters are suitable to treat sludge from environmental, chemical, oleo-chemical, mineral-fuel and lube oils, animal-based products, food and beverage processes and can be configured to meet the application requirements. 513-275-4720; www.pieralisi.com

Chemical/Polymer Feeding Equipment

BLUE-WHITE INDUSTRIES FLEXFLO M4

The low shearing pumping action of FLEXFLO M4 peristaltic pump from Blue-White Industries allows it to gently and precisely pump chemicals that off-gas, including peracetic acid and sodium hypochlorite, with no vapor lock and no lost prime. Advanced features include a highly responsive and intuitive 5-inch display, firmware that can be field updated, and easy-to-



FLEXFLO M4 peristaltic pump from Blue-White Industries

attach M12 watertight connectors. The pump also has built-in tube failure detection, requires very little maintenance, and has a 10,000-1 turndown ratio. 714-893-8529; www.blue-white.com

FORCE FLOW TOTE BIN SCALE

The Tote Bin Scale from Force Flow allows plant operators to accurately monitor the amount of polymer being fed from IBC-type totes for dewatering. Simply place the tote on the platform and monitoring begins, as there is nothing to install inside the tote. Monitoring systems prevent costly overfeed conditions and enable the documentation of the actual amount fed, which keeps the plant in



Tote Bin Scale from Force Flow

compliance with federal and state reporting requirements. Users can remotely monitor from SCADA or PLC. The unit is available with the SOLO G2 digital display or with the advanced Wizard 4000 chemical inventory management system. **800-893-6723; www.forceflow.com**

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% 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% with reductions to 98% in BOD, COD, FOG and TSS. Effluent is clear, the unit has few moving parts, and the size of filter media can be selected according to job requirements. Standard equipment includes a roll-over tarp system; side, floor and center screens; 1/4-inch floor plate; 7-gauge side plates; four door-binder ratchets; eight drain ports; two inlet ports; and a long-handle scraper. Units are also available in a 15-yard size. **979-245-5656; www.aqua-zyme.com**



ADS dewatering unit from AQUA-Zyme Disposal Systems

PARK PROCESS SLUDGE KING II



Sludge King II dewatering container from Park Process

The Sludge King II roll-off dewatering container from Park Process incorporates an engineered design that eliminates trapped water in the bottom of the filter cake. The second center wall filter increases filter area by 33% producing drier cakes in less time. The plastic floor panels that cover the floor space between wall filters and center wall filters serve three purposes. They hold down the bottom of the

filter elements, help eliminate standing water and facilitate dumping of filter cake. The inlet manifold is split into three inlets, each with a ball valve, allowing incoming flow to be distributed evenly into the three compartments formed by the two center-wall filters. **855-511-7275; www.parkprocess.com**

Grinders/Shredders

HYDRA-TECH PUMPS S4SHR AND S4SHR-LP

S4SHR and S4SHR-LP 4-inch hydraulic submersible shredder pumps from Hydra-Tech Pumps are designed to continuously rip and shear solids with a 360-degree shredding action. The pump's carbide-tipped impeller and hardened macerator suction plate work together to produce a violent shredding action that keeps the discharge open. This 4-inch pump is suitable for municipal, industrial, agricultural and institutional waste applications. The S4SHR-LP is narrower in size at 21.5 inches, which allows it to fit through most manholes. Depending on the application, there is a version for portable or fixed installations. A guide rail assembly is available for stationary



S4SHR and S4SHR-LP shredder pumps from Hydra-Tech Pumps

applications. Combined with HT16 to HT25 power units, the S4SHR is capable of flows up to 810 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**

VAUGHAN SELF-PRIMING CHOPPER PUMP

Self-priming Chopper Pumps from Vaughan are designed to be easily accessed outside of the wet well while pumping waste solids at heavy consistencies, without plugging or dewatering of the solids. They eliminate the loss in production and mess, along with making it easy to service the pump to get it back in operation. **888-249-2467; www.chopperpumps.com**



Chopper Pumps from Vaughan

Grit Handling/Removal/Hauling

SMITH & LOVELESS PISTA INVORSOR

Inspired by extensive expert CFD modeling and developed rigorously in actual field conditions, the PISTA INVORSOR grit removal system from Smith & Loveless combines the power of proven particle capture methods: enhanced settling by inclined plates meeting a defined surface overflow rate with the established hydraulic forced vortex to achieve ultra-fine grit removal efficiency down to 75-micron particle size across all flows with no derating. It helps deliver lower capital and operational



PISTA INVORSOR grit removal system from Smith & Loveless

costs, larger capacity in individual units, greater design flexibility for inlet-outlet design options, and a higher surface-area-to-volume ratio to generate consistent fine grit capture during low flow, daily flow and peak flow conditions — up to 50 mgd in single units. **800-898-9122; www.smithandloveless.com**

Septage Receiving Stations

SCREENCO SYSTEMS TRASH MASTER 600 AUTO SCREEN

The Trash Master 600 Auto Screen from Screenco Systems uses gravity to separate the trash from the flow stream through a 6-inch inlet with dual fan spreaders. It is capable of power offloading vacuum trucks with a single 6-inch offload or 2- to 4-inch offloads at the same time at a rate of up to 800 gpm. It comes with an aluminum hopper (optional stainless steel), with 8-inch outlet cam and 3/8-inch gaped 1/4-inch stainless steel bar screen. The stainless steel U-channel with plastic lined titanium UHMW provides for years of wear, with a high-strength alloy steel 11 1/2-inch shaftless screw that moves trash to a waste container. The stainless steel U-channel has slotted drain holes and a center channel bar screen for cleaner and dryer trash. A custom-built stainless steel bar rake and cleaning brush are included for easy maintenance. **208-790-8770; www.screencosystems.com**



Trash Master 600 Auto Screen from Screenco Systems

Screening Systems

EVOQUA WATER TECHNOLOGIES FORTY-X DISC FILTER ARMOR SERIES

The Forty-X Disc Filter Armor Series from Evoqua Water Technologies is a high-rate filtration device that utilizes an integrated pre-screen and stainless steel panels that are designed to accommodate



Forty-X Disc Filter Armor Series from Evoqua Water Technologies

high solids loading capacities and greater hydraulic throughput. The woven optimum primary mesh filter panel utilizes 316L stainless steel threads to create a weave that improves solids collection and rejection, which makes this disc filter suitable for storm flow applications. The panel configuration includes a molded structural frame and pressured assisted seal, allowing the panels to sustain and operate at a higher headloss and provide higher throughput when compared to other disc filter synthetic media. The series combines the technology of outside-in and inside-out filtration into a single PLC controlled unit with influent water flowing through the prescreen (outside-in) into the disc filter panels (inside-out). This combination of two filtration technologies provides an effective option for challenging applications. **844-409-9492; www.evoqua.com**



Custom fabricated MBBR Screens from Federal Screen Products

FEDERAL SCREEN PRODUCTS MBBR SCREENS

Federal Screen Products custom fabricates MBBR Screens that maximize flow rates while containing biofilm carriers, helping save on

maintenance costs. They are fabricated with wedge wire by resistance welding V-shaped wire on

shaped support rods. These thousands of fused points create a honeycomb-like structure that provides a strong and accurate continuous slot. This results in a product that provides accurate flow, distribution and effective media and debris filtration and retention. Wastewater screens are available in a wide range of profile wires to suit most systems, and can be designed in flat, curved or cylindrical form to meet customers' drawings and specifications. Robust for vertical wall applications, screens are also self-cleaning when designed to the flow rate and are passivated in-house, which allows for a quality of finish, extending product life. **905-677-4171; www.federalscreen.com**

JWC ENVIRONMENTAL XE SCREENINGS WASHER MONSTER

The JWC Environmental XE Screenings Washer Monster is a fully automated grinding, washing and compacting system. It can handle the first flush loading associated with storm flows. It is finely tuned to optimize the cleanliness and dryness



JWC Environmental XE Screenings Washer Monster

of screenings based on the feed rate; reducing the volume of screenings that must be hauled away. It preconditions screenings with a Muffin Monster two-shafted grinder that breaks open rags, plastics and trash to promote washing and removal of soft organics. Liquefied organics return to the plant flow and allow it to achieve cleaner screenings. It has numerous control parameters for programmable wash cycles and a triple-zone spray wash for ultimate cleaning. Its dual-helix auger includes a brush attachment that keeps the screen clean and eliminates material catch points. **800-331-2277; www.jwce.com tpo**



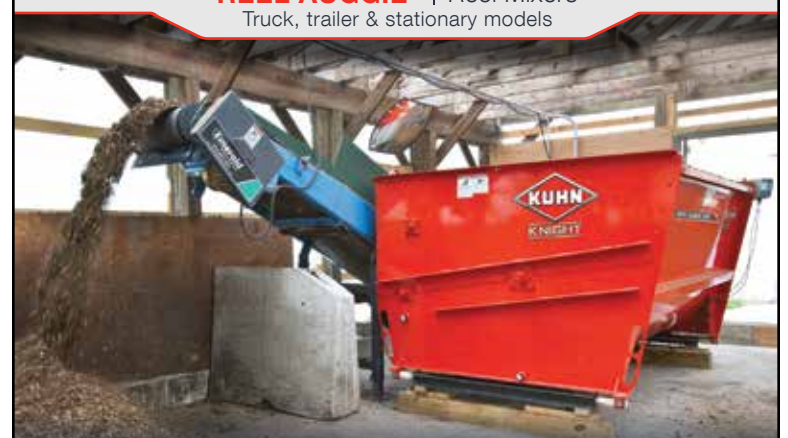
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Utility seeks to improve belt filter press performance

Problem

The Connellsville (Pennsylvania) Municipal Authority needed to overhaul the solids process for a new wastewater treatment plant built in 2020. Solids from various process stages were concentrated on a gravity belt thickener before anaerobic digestion. The biosolids were then dewatered on a belt filter press, dried in greenhouses and landfilled. The belt thickener was over 30 years old. The city sought an upgrade to handle more throughput with greater efficiency.

Solution

The authority chose an **OMEGA gravity belt thickener**. Supervisor Jerry Fox observes that the equipment from Aqualitec is made of high-quality stainless steel and is more durable than the previous system. “We’re using half the polymer versus before,” he says. The unit is designed to reduce volume by at least four times. The simple and sturdy design offers benefits including low energy consumption, low maintenance and low operation supervision.



RESULT:

Fox is fully satisfied with the thickener’s performance: “Now our maintenance is reduced significantly. It runs smoothly, the maintenance is super simple, and the starting and closing procedures are impressive.” 855-650-2214; www.aqualitec.com

Upgraded technology extends life of screens at treatment plant

Problem

In 2011 and 2013, the Chelford City Municipal Utility District wastewater treatment plant in Texas, operated by Si Environmental, replaced two antiquated climbing screens with Duperon FlexRake screens. The improved performance was immediate and long-lasting, persevering even through Hurricane Harvey’s 53 inches of rainfall, but an upgrade was in the cards.

Solution

The plant decided to upgrade to **Duperon’s FRO IQ rotational assembly** to expand system capacity and capability and improve wear resistance without the financial or operational burdens of a new installation. Designed for existing Duperon screens, the FRO (FlexRake Only) utilizes a sequence technology that delivers four times more debris removal by sensing debris and flow conditions and automatically adjusting speed. When large debris is presented at the screen, the links can disengage scrapers as needed to remove it, while the leading and trailing scrapers return to the engaged position.



RESULT:

“Out of all the screens I’ve seen in my 39 years of being in this business, the Duperon screens are my favorite,” says Ramon Castillas of Si Environmental. “These screens have made our lives easy, because they are operator friendly, low-maintenance, and if you keep them washed down, they’ll work forever.” 800-383-8479; www.duperon.com

Press leads to improved capacity and space savings

Problem

The 3.15 mgd (design) treatment plant in Marseilles, Illinois, averaged 1.25 mgd and produced 55 dry tons of biosolids per year. Increased solids production taxed the capacity of the drying beds, which took two to six months to dry in ideal conditions. Aerobic cake averaged 17 to 19% solids and anaerobic 20 to 24%. “The cake had to be stored for three years before land-applying it,” says Don Christensen, wastewater superintendent. “We were running out of storage options and needed more dewatering capacity, but had no extra space for it.”

Solution

The city installed a **2-900/2000CV two-channel expandable Fournier Rotary Press**. Biosolids are fed at low pressure into a channel between two 36-inch parallel filters. As water drains out, solids collect against the outlet restrictor gate. Slow rotation of the filters produces enough backpressure to dewater the solids and extrude a dry cake. More dewatering channels can be added for future increase in sludge production. The press is low maintenance and energy efficient.



RESULT:

The plant now uses the drying beds for storage. “The press has improved our biosolids process by leaps and bounds,” says Christensen. “The best thing is, once we start the press, we can leave it unattended. It automatically adjusts to changes in the material.” 800-463-6328; www.fournierdewatering.com

Receiving station helps ready plant for increased influent load

Problem

Legislation for septic tanks in Florida may increase septage volume at Indian River County’s Residuals Dewatering Facility. Moves are afoot to require inspection and pumping of septic tanks every three to five years.

Solution

The county chose a fully automated and complete **Raptor septage receiving station plant** from **Lakeside Equipment**. The small-footprint, self-contained unit compacts and dewater screenings to 40% solids. An overnight self-cleaning cycle stops the buildup of grit in the bottom of the unit. The system is pre-engineered, and all-stainless steel construction resists corrosion.



RESULT:

Far more grit and rags are captured than anticipated. A 4-cubic-yard container is filled daily. There have been no equipment issues, and only basic daily maintenance is required. 630-837-5640; www.lakeside-equipment.com

Large city undertakes sludge thickener improvement project

Problem

A large city in the Southwest U.S. wanted to replace aging infrastructure in dissolved air flotation units and the building that housed them. Plant managers researched simpler and cleaner options that would reduce their polymer usage when thickening waste activated sludge.



Solution

After pilot testing a variety of rotary drum thickeners, the team chose the **Hycor ThickTech thickener (Parkson Corporation)** based on its high capture rates and low polymer usage. Four units were installed in 2021.

RESULT:

The units exceed performance expectations. Space is open for additional units to be installed in the future. 888-727-5766; www.parkson.com

Screw press chosen for dewatering at treatment facility

Problem

The wastewater treatment plant in Waianae, Hawaii (3 mgd) produces anaerobically digested biosolids mechanically dewatered for transport. The centrifuge dewatering system was approaching the end of its useful life.

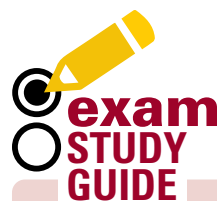
Solution

The plant team selected screw press dewatering for its performance, ease of use, low maintenance and low energy requirements. Given the high electricity cost on the Islands, a system with the same throughput but requiring 10% of the horsepower was a welcome improvement. The team chose **Schwing Bioset** equipment as the best overall value. The **FSP703 machine** dewateres at a rate exceeding 1,000 dry pounds per hour, per unit while fitting within a footprint similar to that of the centrifuge.



RESULT:

Plant staff members were impressed with the machine's construction quality and ease of use. The system consistently produced cake at 24% solids reducing labor and hauling costs. 715-247-3433; www.schwingbioset.com tpo



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.

WASTEWATER

By Rick Lallish

What type of diffuser gives the best oxygen transfer but less efficient mixing?

- A. Coarse-bubble
- B. Fine-bubble
- C. Volcano pressurized
- D. Mechanical

ANSWER: B. Diffusers to provide aeration are common in various wastewater treatment operations. Fine diffusers typically produce 1-3 mm bubbles and have much greater oxygen transfer, but they are less efficient at mixing than coarse-bubble diffusers, which produce 5-12 mm bubbles. When choosing the best diffuser, operators must determine what attribute is most important to the plant. Many varieties of each are available, with all information needed to make the best choice. More information may be found in the WEF textbook: *Wastewater Treatment Fundamentals I: Liquid Treatment*, Chapter 6.

DRINKING WATER

By Drew Hoelscher

Which component helps prevent motor bearing damage from water leakage inside the stuffing box?

- A. Lantern ring
- B. Slinger ring
- C. Snap ring
- D. Wear ring

ANSWER: B. The slinger ring is located toward the back of the stuffing box and is sometimes referred to as the deflector. There is always leakage inside the stuffing box when mechanical packing is installed. Leakage may also occur inside the stuffing box when a mechanical seal fails. The water leaking in the stuffing box follows the shaft until it contacts the slinger ring. Motor bearing damage is prevented by the slinger ring redirecting the water away from the electric motor.

ABOUT THE AUTHORS

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

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OZ Lifting Aluma-Lite davit cranes

OZ Lifting Products announced the new Aluma-Lite davit crane for wastewater and water operators. The Winona, Minnesota-based manufacturer has released the ultra-portable davit crane in 500- and 1,000-pound capacities, each available with three bases: pedestal, socket (flush-mount) or wall-mount. The Aluma-Lite 500 weighs in at 24 pounds with a maximum capacity of 500 pounds and the Aluma-Lite 1,000 weighs in at 47 pounds with a maximum capacity of 1,000 pounds. Both fold flat for easy storage or transportation, and are made of aerospace/military grade aluminum. The cranes are available with a manual winch (including drill drive adapter), AC or DC electric winches. The Aluma-Lites have a durable, powder-coated finish, no tools are needed for assembly/disassembly, and they are made in the USA.

800-749-1064;
www.ozliftingproducts.com



Pulsafeeder Pulsatron MP Series pump

Pulsafeeder's Pulsatron MP Series pump now features an optional 4-20mA output signal that provides a remote indication of pump speed. This allows for remotely confirming the pump's speed and adjusting to process parameters, to more accu-

product spotlight wastewater

System provides seamless remote monitoring

By Craig Mandli

Remote monitoring is, in essence, all about return on investment. That's because monitoring wastewater treatment equipment is an economical way to provide immediate notification of potential malfunctions that can lead to costly breakdowns. Modern treatment systems typically include alarms that alert operators when a malfunction occurs. However, remote monitoring systems also offer data logging functionality and are available with a variety of different sensors. This enables operators to perform predictive maintenance, prevent unscheduled shut-downs and optimize the best efficiency point of the pumps and components.

The **Sentinel PRO** from **Sensaphone** is just such a system, providing water and wastewater facility operators easy, cost-efficient 24/7 remote monitoring of equipment and environmental conditions. The system seamlessly interfaces with any water or wastewater processing equipment that uses a programmable logic controller. And according to the company, the system is ideal for water and wastewater professionals because it easily integrates devices, polls Modbus registers from other equipment and delivers critical system-wide data.

The proof is in the system's capabilities. Supporting both Modbus RTU-485 and TCP protocols, the system can monitor up to 64 Modbus registers. In addition, the system accommodates 12 universal external digital or analog status sensors to monitor conditions including power, pump status, tank level,



Sentinel PRO from Sensaphone

turbidity, flow rate, pressure, temperature, humidity and water leaks. It sends immediate notification via text, email or phone call when sensor readings move outside of preset parameters, which can indicate potential costly threats to pumps and systems, along with environmental and safety impact.

For instance, if treatment systems are left unattended and the equipment malfunctions, it could be some time before someone realizes the system failed. This could result in releasing untreated effluent, contaminating the environment, and receiving fines and citations from regulators as well as public scorn.

The cloud-based Sentinel PRO system is also a data acquisition device that lets users log information quickly and easily. Operators review data, set alarms, acknowledge alerts and generate reports from a mobile device, tablet or computer via the dedicated website or free app. Sensaphone manages and provides its own secure cloud platform that its in-house engineering and IT team services 24/7. For remote locations without internet or Ethernet connectivity, a 4G cellular Sentinel PRO system is available.

855-807-1887; www.sensaphone.com

rately estimate chemical usage over time. The pump transmits a 4-20mA signal proportional to the actual speed of the unit and is factory-calibrated for easy installation in the field. Packed with standard features, the Series MP includes automatic control via 4-20mA or 20-4 mA inputs, an external pace function with a stop feature, and a graphical LCD display with support for English, French, German and Spanish. With models capable of flows ranging between 3 and 504 gpd and pressure ranges from 20 to 300 psig, and a turndown ratio of 1000:1, there is a Pulsatron MP Series pump to fit every process.

800-333-6677;
www.pulsatron.com



Blue-White APH20 Multi-Parameter Online Analyzer

Blue-White's Multi-Parameter Online Analyzer is a turnkey monitoring solution for clean water applications, and installation is quick and easy. The APH20 measures ultra-low turbidity, free chlorine, pH and temperature, eliminating the need for supplemental sensors. The unit is not only accurate, it features an easy-to-operate touch screen display that includes a data logging terminal and

real-time measurement. Blue-White offers additional analyzer options, including the APNTU Inline Turbidity Analyzer, used to measure ultra-low turbidity, and the APFCL Inline Oxidizer and pH Analyzer, used to measure free chlorine, pH and temperature.

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



Ecosorb EcoLink online monitoring portal

Ecosorb's EcoLink is an online portal for remote monitoring and

control of industrial odor neutralization systems. With EcoLink, users can manage their equipment from anywhere in the world with any device capable of hosting a web browser, such as a smartphone, tablet or PC. Using EcoLink, Ecosorb units can be managed remotely in the cloud, lifting local limitations for monitoring operations and making adjustments. Benefits include the ability to remotely start, stop and change vaporization system operating mode; identify low product levels; track and trend flow rates, energy use, downtime and other key performance indicators; send alerts and notifications to an operations team; adjust product dosage to coincide with fluctuating odor-producing periods; encrypt data for transit and storage; and view metrics, charts and diagrams on an intuitive dashboard. **800-662-6367; ecosorbindustrial.com**



Warren Controls Series 200 high-capacity vacuum breaker

Warren Controls' Series 200 high-capacity vacuum breaker is ideal for use on outdoor tanks where there's concern over falling temperatures causing tank collapse. The vacuum breaker opens gradually to admit outside air to relieve the vacuum in the tank, eliminating possible damage caused when falling liquid levels and condensing steam causes a vacuum that can damage a tank. Available in cast iron, carbon steel and stainless steel bodies and seats, the Series 200 is offered in sizes ranging from 2 to 12 inches, with a variety of trim and paint

options. The valves feature air relief capacities up to 14,280 scfm of air in the largest size and ANSI Class 300 flanges.

800-922-0085; www.warrencontrols.com



Torrey Pines EchoTherm RHB20 Series

The EchoTherm RHB20 Series from Torrey Pines was designed for use in robotic systems. It is a small, self-contained unit that runs off 12 volts DC. The unit comes with an RS232 cable for connecting it to a PC via any open serial port. The Serial Command Set, provided with the unit, gives the user the information needed to control the RHB20.

After the RHB20 has been instructed to go to a temperature, the unit can be disconnected from the computer, retaining the target temperature until told otherwise. Then, the computer can be used to instruct another RHB20 using the same serial port. As the unit heats toward its target temperature, the LED on the unit will flash. When the flashing stops and the LED is constantly lit, the unit is stable at the target temperature.

866-573-9104; www.torreypinesscientific.com tpo



product spotlight water

Application employs machine learning to enable real-time forecasting

By Craig Mandli

Thanks to new technology, water and wastewater operators are inundated with data on a daily basis. But acting on this data is limited by how fast it can be analyzed. Without processing guidance, operators can struggle to use that data for better performance, efficiency and speed in the treatment process. Fortunately machine learning — algorithms and software that enable management systems to learn from data — can help overcome these challenges.

A new streaming analytics application from **infinittii ai** — **face pro** — is designed to allow users to add logic and algorithms for real-time processing. The application's machine learning helps manage and operationalize production-ready models for generating new data or output events such as predictions. According to Jean Charles Phaneuf, CEO of **infinittii ai**, a key feature for water and wastewater applications is the ability to build analytic models that act on sensor data or other data sources with a built-in script editor, using either newly created or existing scripts from open-source libraries.

“Our **infinittii face pro** is a game-changer for our customers and partners,” says Phaneuf. “This new product empowers them in their development and deployment of applications, provides more autonomy and offers us unlimited potential in the Smart City water infrastructure market. Our **face pro** is at the heart of our future business growth.”



face pro from **infinittii ai**

Data engineers and scientists can use **infinittii face pro** to write Python and R scripts using their preferred development environment, then copy and paste the code into **face pro**. According to Phaneuf, its use can provide better data-driven insights for making faster, more informed decisions, particularly with real-time and forecasting applications. Applications include forecasting, anomaly detection, predictive maintenance and failure prediction. According to Phaneuf, **face pro** is just one component of the **infinittii** dataworks platform for Smart City water infrastructure.

“**infinittii ai**'s expanded product portfolio reflects deep engagement with our customers and business partners on machine learning innovation,” he says. “The platform offerings are the result of years-long team R&D efforts that successfully evolved into products. We are now very well positioned for a new growth era where customers are searching for leading-edge AI-driven predictive analytics that bring added value.” **778-379-0275; www.infinittii.ai**

Centrisys/CNP to open new service and repair center in Texas

Centrisys/CNP will open a new 35,750-square-foot service and repair center in Houston. Located on the northwest side of the city, the new center will support Centrisys/CNP customers not



only in the metro area but also customers located throughout the South-Central region of the U.S. Expected to open in January, the new facility will offer full-service repair and maintenance capabilities, including inspections, machining, welding and balancing. On-site technicians will also have the capability to test equipment and manufacture spare parts all under one roof, with quality control capabilities for all brands of decanter centrifuges.

Brown and Caldwell's Sarah Reeves is a WEF Fellow

Brown and Caldwell's Vice President Sarah Reeves was named a Fellow of the Water Environmental Federation. The fellow designation recognizes members' achievements, stature and contributions to the preservation and enhancement of the water profession. With over 25 years' experience, Reeves is an expert in water quality policy and regulation, and is focused on developing and driving stakeholder involvement to influence solutions to overcome the most complex water-related challenges.

The Water Council Announces Alliance with KPMG

The Water Council announced a strategic alliance with KPMG on corporate water stewardship and environmental, social and governance reporting. KPMG and The Water Council will work together to help companies identify and manage water-related business risks, understand and mitigate their adverse impacts on ecosystems and communities, and contribute to more sustainable management of shared freshwater resources using The Water Council's WAVE: Water Stewardship Verified program.

Stantec-Freese and Nichols JV awarded contract with U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers Mobile District has selected the Stantec and Freese and Nichols Joint Venture for a five-year task order contract to support the district's Water and Wastewater Technical Center of Exper-

tise. The Joint Venture will provide the district's WWTCX with planning, design and construction phase services. Based in Mobile, Alabama, the WWTCX provides guidance to the entire Corps worldwide on potable water supplies; water treatment, storage and distribution; and domestic and industrial water/wastewater collection, pumping, treatment and disposal.

TriNova opens new facility in New York

TriNova, an Endress+Hauser authorized sales and service representative since 2002, celebrated the opening of its new northeast facility. The \$4 million, 11,400-square-foot building in Clifton Park, New York, includes a new Process Training Unit that will bring a new training experience for Endress+Hauser and Rockwell Automation. TriNova also plans to educate area high school students on the value of an engineering degree.

Nidec Motor adds marketing communications manager

Nidec Motor Corporation expanded the marketing staff at its St. Louis, Missouri, headquarters with the addition of Flavia Bader as marketing communications manager. She is part of Nidec's commercial and industrial motors division for the Americas, serving industries that rely on high-efficiency motors including HVAC, pumping and wastewater. Bader has more than 20 years' experience in the industry, having worked at Emerson Electric in marketing and product management roles. She has a BA in communication and an MBA, both from the University of Louisville.



Flavia Bader

Grundfos holds grand opening for global headquarters

Grundfos held a grand opening of its Grundfos U.S. headquarters located outside of Houston in Brookshire, Texas, on Nov. 2. Grundfos executives hosted a ribbon-cutting to commemorate the opening of the new building and then hosted a facility tour. The new 48,670-square-foot building was LEED-certified v4 Platinum. It is fully electric, uses no fossil fuels and relies on solar energy, natural light and energy-efficient equipment. Less than 13% of the water usage is sourced from the local municipal system. Nearly a million gallons of water are collected annually from rainwater and the hydronic HVAC system. **tpo**

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people/awards

Belinda Sturm, Ph.D., a professor in the University of Kansas Department of Civil, Environmental and Architectural Engineering, received the 2022 Paul L. Busch Award from the Water Research Foundation. With this \$100,000 research prize, she will assess how the physical, chemical and biological properties of aerobic granular sludge affect the removal of pathogens and microplastics from wastewater.

Plymouth Village Water and Sewer District received the 2022 Asset Management Award from the New Hampshire Department of Environmental Services. The award encourages communities to adopt holistic, cost-effective approaches to manage total infrastructure systems over the life cycle of assets.

For the 18th consecutive year, the **Fremont Wastewater Treatment Plant** received the Scott Wilbur Award for outstanding operation and maintenance from the Nebraska Water Environment Association.

The Washington Suburban Sanitary Commission's **Seneca Water Resource Recovery Facility** received the Project Excellence Award from the Water Environment Federation and the National Association of Clean Water Agencies.

Seattle's Shape Our Water Community Vision received a 2022 WEF Public Communication and Outreach Program Award.

The **Idaho Rural Water Association** earned the 2022 State Association of the Year Award from the National Rural Water Association.



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events

Feb. 1

AWWA How to Use the Effective Utility Management Framework to Improve Your Utility webinar. Visit www.awwa.org.

Feb. 6-8

New York Water Environment Association Annual Meeting, NYC Marriott Marquis. Visit www.nywea.org.

Feb. 7-9

Hawaii Water Environment Association 2023 Pacific Water Conference, Hawaii Convention Center. Visit www.hwea.org.

Feb. 14-16

Evergreen Rural Water of Washington 2023 Annual Conference and Trade Show, Hilton Vancouver Washington. Visit www.erwow.org.

Feb. 15

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

Feb. 20-22

Iowa Rural Water Association Annual Conference, Veterans Memorial Community Choice Credit Union Convention Center, Des Moines. Visit www.iowaruralwater.org.

Feb. 20-23

AWWA Membrane Technology Conference 2023, Knoxville (Tennessee) Convention Center. Visit www.awwa.org.

Feb. 27 - March 3

Rural Water Association of Utah Annual Conference, The Dixie Center, St. George. Visit www.rwau.net.

Seattle Public Utilities received a 2022 Platinum Award for Utility Excellence from the Association of Metropolitan Water Agencies.

Oliver Grievson of Z-Tech Control Systems received the Outstanding Contribution Award at the WWEM Water, Wastewater and Environmental Monitoring Conference and Exhibition.

Prairielands Groundwater Conservation District in Cleburne received the Texas Rain Catcher Award in the government category from the Texas Water Development Board.

Emporia was honored for best-tasting water by the Kansas Water Environment Association and Kansas Section AWWA.

The **Ricky L. Miller Water Treatment Plant** in the Town of Boone received a Gold Star honor for the North Carolina Area Wide Optimization Award from the North Carolina Division of Water Resources.

The **Falmouth Water Department** received the 2022 Massachusetts Water Works Association Community Award.

Sandy O'Neill, a chemist at the Rock Island (Iowa) Water Treatment Plant, retired after 34 years of service.

Mark Soucy, water/wastewater director for Fort Kent, Maine, retired after 25 years of service.

TPO welcomes your contributions to Worth Noting. To recognize members of your team, please send notices of new hires, promotions, certifications, service milestones or achievements as well as event notices to editor@tpomag.com. **tpo**

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