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JULY 2020

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Superintendent
Racine, Wis.

A Group Effort

AN AWARD-WINNING WISCONSIN SUPERINTENDENT SHARES CREDIT WITH HER TEAM | 22

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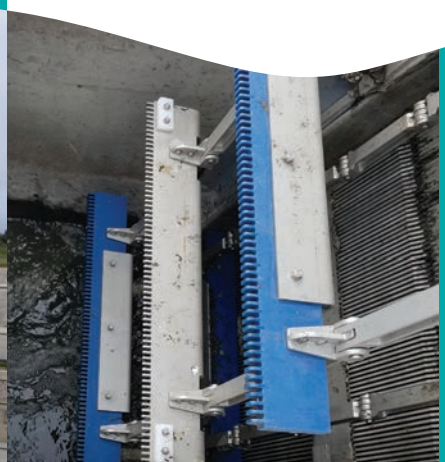

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top performers

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let's be clear

The Three Ps: Perplexing Pipeline Problem

PRODUCT STANDARDS? EDUCATION? GRINDING? WHAT WILL SOLVE THE WIPES PROBLEM? CLEAN-WATER AGENCIES AND WIPES INDUSTRY GROUPS HAVE DIFFERING PERSPECTIVES.

By Ted J. Rulseh, Editor

The battle over wipes in sewers continues unabated. The National Association of Clean Water Agencies is working with state and regional partners to explore dealing with the issue through legislation. The wipes industry association (INDA) and allies have created the Responsible Flushing Alliance to address "the true causes of clogging and debris accumulation problems in the wastewater infrastructure" and to advocate solutions through consumer education and responsible product labeling.

Meanwhile, clean-water utilities struggle with buildups of wipes (and, in fairness, other nondegradable items) in their sewer systems, pump stations and treatment plants. No one questions whether a problem exists. The contention in part revolves around whether some wipes are flushable, what that term means in practice and how wipes packaging should be labeled.

A PERSONAL PERSPECTIVE

I bring perhaps an unusual viewpoint to the issue. If not for my wife, I probably would go through my earthly existence never having purchased a single wipe. I find their price-to-value ratio severely out of whack — old-fashioned rags, cheap washcloths and the occasional paper towel do me just fine.

When my wife uses wipes, she drops them in the trash — we're well-informed consumers by virtue of my role with this magazine and our ownership of a septic system.

On these pages, I have advocated for education as the real solution, because if everyone flushed only the three Ps of pee, poo and (toilet) paper, there would be no wipes in our sewer systems. That of course is a gigantic "if," and to cling to it is surely naïve. From where I stand, it's also naïve to think the solution lies in flushability standards and the proper labeling of products.

WHAT'S TO BLAME?

How many of us pay attention to the packaging of familiar items beyond the type and brand? I can guarantee I have never looked for or noticed any flushable versus nonflushable labeling on a wipes container. In this respect I'm probably no different from most consumers. How many of us religiously "read and follow label directions" on things we buy routinely?

The wipes industry is fond of citing a 2013 study that analyzed sewer system screenings and found that only about 8% of items on screen clogs could be identified as wipes marketed as flushable. The rest consisted of paper towels (47%), baby wipes (18%), feminine care items (13%) and household wipes for hard-surface cleaning and disinfecting (14%). The wipes in this group were neither designed to be flushable nor marketed as such.

Therefore, goes the reasoning, flushable wipes are not the issue, and things would be far better if people flushed only flushable wipes. But don't try selling that to clean-water agencies or, for that matter, many plumbing professionals. Their experience tells them that even so-called flushable wipes contribute to clogging problems.

TOWARD RESOLUTION

I believe INDA is sincere in saying its members are working to resolve the problem. After all, it's in the industry's interest to do so for the protection of its products and markets. Notably, the industry touts a seven-part test that wipes must pass to earn a "flushable" label. The problem, though, is not as simple as labeling products. If it were that simple, then surely clean-water agencies' education campaigns under slogans like "The Toilet Is Not a Trash Can" and "No Wipes in the Pipes" would be universally effective. They're not.

We're dealing with human nature, with consumers who have variable levels of education, and with people who have busy lives and multiple priorities that don't include scrutinizing the labels on wipes containers. If some wipes are labeled as flushable and others not, wipes of both kinds will continue to get flushed. Accuracy in labeling may help, but it will not make the critical difference.

If some wipes are labeled as flushable and others not, wipes of both kinds will continue to get flushed. Accuracy in labeling may help, but it will not make the critical difference.

MECHANICAL MEANS

So, what's the bottom line? Again, from where I sit, wipes producers can help by refining their products so that wipes marketed as flushable truly are — so that they disintegrate in the pipes at rates as close to toilet paper as technically possible.

Clean-water agencies can help by putting more money and effort behind campaigns to educate consumers on what they should and should not flush. This could include targeting areas of the system where wipes and other nondegradable items are the most prevalent. It could also include reporting explicitly how much improper flushing adds to collection and treatment costs on an annual, per-household basis — make it a pocketbook issue.

Ultimately, though, the solution may end up being mechanical. No amount of education and no amount of product labeling will make people almost unanimously change their bad behaviors. There will always be wipes, paper towels, rags and other troublesome items in the sewers.

So, grind them up. Chopper and grinder pumps are available in multiple styles, sizes, configurations and price points. They work. Put them in and let them do their job. Or, in the words of an old children's book about a trash collection crew, "Start the chewer-upper, Sam!" tpo

letters

The Unsung Heroes

When people take a minute to be thankful during the COVID-19 pandemic, they praise front-line workers who tirelessly keep us safe and fed. These people are recognized for their contribution to the greater good.

I want to take a minute to thank the employees of the Fairhaven (Massachusetts) Sewer/Wastewater Department. Without praise or recognition, they put their lives on the line daily, enabling customers to flush toilets, wash laundry and shower without flooding their homes with potentially lethal sewage. These essential workers deal nonstop with the threat of not only COVID-19, but hepatitis, typhoid, paratyphoid, bacillary dysentery, gastroenteritis and cholera. Yet they do not receive praise.

As department superintendent, I have known my operators and crews for 33 years and have watched them do dirty, nasty, gagging jobs few others would consider doing. They get no pizzas, or cookies, or thank you posters from school children. Without awards or public recognition, my environmental protection warriors work tirelessly at the back end, enabling those at the front end to do their jobs without giving a thought to where the sewage goes.

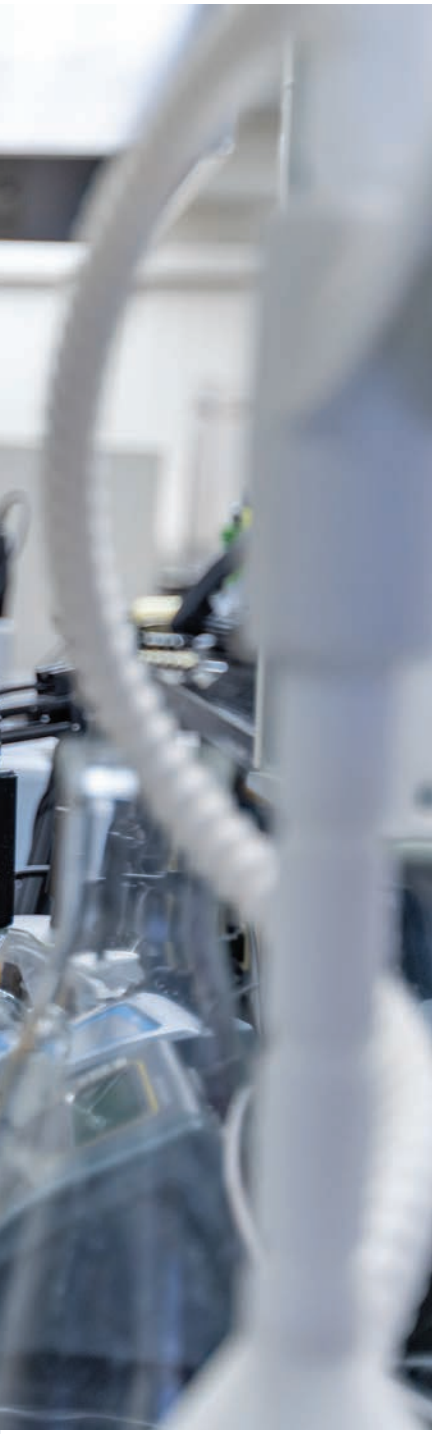
I want to personally thank, from the bottom of my heart, all these employees for keeping us safe at their own peril. I also want to thank Charlie Murphy, Fairhaven selectman; Pattie Pacella, president of the Fairhaven Rotary Club; and Donna Bosworth, fitness instructor at Dartmouth Total Fitness, for supplying fabric masks so sewer crews can work in public with some protection from their newest enemy — COVID-19.

Sincerely,
Linda L. Schick, superintendent
Fairhaven Sewer/Wastewater Department

All-In for Recycling

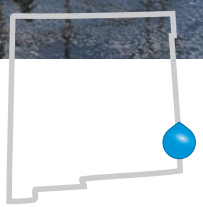
THE HOBBS WASTEWATER RECLAMATION FACILITY IN SOUTHEAST NEW MEXICO RECLAIMS ALL ITS INFLUENT AND BENEFICIALLY USES ITS ENTIRE BIOSOLIDS STREAM

STORY: **Ted J. Rulseh**
PHOTOGRAPHY: **Steven St. John**



Team members like Jasmin Boyd, laboratory technician, get credit for effective operations at the Hobbs facility.

John Kunko, control operator, checks the sludge blanket in the final clarifier.



The Ogallala Aquifer is an essential source of water for America's breadbasket in the west-central high plains. It is being drawn down faster than nature can replenish it, largely for farm irrigation.

The New Mexico city of Hobbs draws water from that aquifer — but about 3.6 mgd less today than years ago. The city's wastewater reclamation facility now recycles essentially all of its influent, using it to irrigate a large farm, golf course, cemeteries and a soccer complex. That water displaces potable water formerly drawn from underground.

Meanwhile, biosolids from the treatment process are dried to create a Class A fertilizer/soil conditioner that the farmer spreads on his fields and city residents take home and apply to their lawns and gardens.

That end-to-end recycling initiative is a source of pride for Bill Griffin, facility superintendent, and his nine team members. It has also helped bring major recognition to the city. The plant earned the 2019 Max Summerlot Award from the New Mexico Water and Wastewater Association — it is the state's highest honor for excellence in operations, maintenance, management, safety and professionalism in water reclamation facilities.

Hobbs (New Mexico) Wastewater Reclamation Facility

www.hobbsnm.org/wwtp.html

BUILT:
1980; major upgrade 2008-10; new aerobic digesters 2019

AREA SERVED:
City of Hobbs

POPULATION SERVED:
38,000

FLOWS:
4.8 mgd design, 3.6 mgd average

TREATMENT PROCESS:
Activated sludge, modified Ludzack-Ettinger process

TREATMENT LEVEL:
Secondary

EFFLUENT:
Recycled and reused

BIOSOLIDS PROCESS:
Thermal drying

BIOSOLIDS USE:
Bag or bulk distribution for horticulture

AWARDS:
2015 and 2019 Max Summerlot awards, New Mexico Water and Wastewater Association

ANNUAL BUDGET:
$1.6 million (operations)

Regular maintenance contributes to the plant's success. Ken Brotherton, lead control operator, inspects gauges for the centrifugal blower (The Spencer Turbine Co.).

MANAGING MAINTENANCE

The newly upgraded Hobbs (New Mexico) Wastewater Reclamation Facility left the plant team with significant challenges. "At the end of the construction, we had to go through and figure out our operational strategy, not to mention that we had acquired 140 new pieces of equipment throughout this plant," recalls Robert Janousek, wastewater operations supervisor.

"We really had to focus on everything from sludge thickener operation to effectively managing the MLE process. There were also some things that happened during construction that we had to rectify. One was an anoxic mixer that could not be pulled out of a basin because of a piping issue. We all stuck together on that and saw it through.

"We have a really good team that will put their heads together and solve problems — first of all for the effective treatment of the waste stream, but also to ease the workload on one another."

On the maintenance front, the team draws on the Antero maintenance data management computerized maintenance management system with AllMax Software. "At first we set that up on a calendar basis with monthly, quarterly, semiannual and annual work orders," Janousek says. "We figured out that we were overmaintaining equipment by that schedule, so we're revamping that to perform tasks based on hours of operation.

"The CMMS has been a godsend for us. We're able to specify tasks that need to be done, per work order, whether it be checking belts, greasing or changing oil. We are getting into more detailed maintenance, such as rebuilds of pumps and mixers. We're good at what we do and devoted to our facility. We plan to be here for a very long time, so we want to make this plant run as smoothly as humanly possible."

Griffin credits the success to his team: "It's the standard they hold themselves to. They want to do good work. They want to be able to step back and say, 'That's good because of us. We did this.' I also appreciate our city commissioners, city manager Manny Gomez, and our utilities director, Tim Woomer. Without Tim's leadership, we wouldn't be able to do what we do."

PERVASIVE EXCELLENCE

The 2019 Summerlot award was the city's fourth in consecutive years. The award alternates each year between wastewater and drinking water facilities. In 2016 and 2020, the award went to the Hobbs water side under Todd Ray, utility superintendent.

Hobbs, a city of 38,000 in New Mexico's southeast corner, lies in an oil-producing area; its climate is semi-arid. Its water reclamation facility was built in 1980 with preliminary screening, grit removal, aeration basins and final clarifiers. Effluent was then piped to a lagoon facility south of the city equipped with a sprinkler system.

That facility was abandoned in the mid-1990s after Hobbs developed a relationship with the farmer who now takes two-thirds of the city's reclaimed water. There original treatment plant received a few upgrades over the years, including the addition of primary clarifiers and a centrifuge for solids dewatering. When the plant ran into capacity issues in 2002, plans were laid for a major upgrade, completed in 2010.

That $30 million project brought the design capacity to 4.8 mgd; today, average flow is 3.6 mgd.

The upgrade converted the primary clarifiers into grit chambers, enclosed all the influent piping, added a new headworks building and UV disinfection, and installed biofiltration for odor control throughout the plant. The bulk of the project was the construction of aeration basins for a modified Ludzack-Ettinger, or MLE, process for BOD and nitrogen removal.

MULTISTAGE AERATION

Submersible pumps (Flygt - a Xylem Brand) deliver effluent to a Channel Monster grinder and auger (JWC Environmental). The water then passes through a flowmeter (KROHNE) and Enviroquip grit chambers (Ovivo USA). The grit proceeds to a Eutek Systems washing system (Hydro International); the wastewater passes through a pair of 3 mm ESR Stair Screens (Vulcan Industries).

> "I basically let the employees do what they need to and give them what they need to do it."
> **BILL GRIFFIN**

The flow then enters the MLE process with three parallel trains. "Where the internal recycle, return activated sludge and influent meet up, we have four anoxic zones with Flygt submersible mixers," Griffin says. "No air is introduced there. We starve the bacteria for air so that they use the oxygen from the nitrate molecules in the influent. That's where nitrogen is given off as a gas."

The flow then enters the aerobic phase of the process with a series of three basins where dissolved oxygen is stepped down from 3 ppm to less than 1 ppm. "We first hit it with a lot of air to get the BOD-destroying microbes going again," Griffin says. "Then we step it down so when the RAS and internal recycle go back to the front of the plant, the DO is at about 0.2 ppm."

OUT TO IRRIGATION

After the final clarifiers (WesTech Engineering), the influent enters the UV disinfection system (SUEZ Water Technologies & Solutions) and then receives a small dose of chlorine to provide a residual in the reclaim water piping. The flow is then metered and sent to a 4-acre pond outfitted with SolarBee solar mixers (Medora) to await distribution.

"The reclaimed water is clear enough coming out of the plant that if you're in a boat, you can see 6 feet down through the water to the liner on the bottom of the pond," Griffin says. A bar screen (WesTech) removes algae buildup before the water enters a 25-foot-deep wet well containing two sets of pumps.

"The pipeline to the farmer has two 300 hp Goulds vertical turbine pumps. That is a low-pressure, high-volume system. In the same wet well, we also have three 100 hp Goulds vertical turbine pumps. Those pumps feed the recycled water system around our plant, feed the cemeteries and soccer complex, and charge the line up to the golf course."

Bill Griffin, superintendent, leads an award-winning plant team.

The pipeline to the golf course spans 13 miles and has purple-painted hydrants along the route that firefighters can tap to suppress grass fires. Another line, also with hydrants, runs to the farm and continues to the former lagoon treatment facility, which serves as a contingency outlet in case a


The team at the Hobbs Wastewater Reclamation Facility includes, from left, Robert Janousek, operations supervisor; Chantley Wilson, bacteriologist; Shane Cox, lead maintenance/Level 4 control operator; Clayton Murrish, control operator; Ken Brotherton, Level 4 lead control operator; John Kunko, control operator; Tim Woomer, utilities director; Bill Griffin, superintendent; Glen Owens, laboratory technician; Alan Trujillo, control operator; Jasmin Boyd, laboratory technician; Mario Padilla and Lorenzo Sandoval, control operators; and Roger Kibad, Level 3 control operator.

problem occurs at the reclamation facility or the farmer needs to shut down irrigation. Any water sent there simply infiltrates the ground or evaporates.

The farm that receives reclaimed water lies 6 miles south. The water irrigates cotton and a rye cover crop by way of 14 quarter-section center-pivot irrigation systems with booster pumps.

THE SOLIDS SIDE

Solids wasted from the process go through rotary drum thickeners (Vulcan) into two aerobic digesters with VariOx jet aeration (Parkson Corp.) and Aerzen blowers. About every 30 days a centrifuge (Alfa Laval) is activated to dewater the material from 2% to 18%-19% solids. "That is a Class B biosolids," Griffin says. "We are permitted as a contingency to send that to landfill."

The dewatered cake is fed to a Fenton Environmental indirect thermal dryer (RDP Technologies), essentially a rotary kiln in which thermal oil at 450 degrees F circulates through a rotating plate heat exchanger. At the bottom of the unit, the oil passes through an additional chamber and transfers heat to the biosolids. The material is heated to 310 degrees F and emerges as 95% solids Class A product.

About 95% of the product goes to the same farmer who receives the reclaimed water. Hobbs team members pack the rest in bags given away to city residents. Its typical NPK nutrient analysis is 2.5-2.3-0.5. "We don't sell the product," Griffin says. "If you get into sales, you encounter legal issues such as guaranteeing the nutrient content. It is basically a low-grade fertilizer or soil amendment that people use as they would a good Class A compost."

TEAM COHESION

Making it all work is a veteran core operations and maintenance group backed by newer team members. Robert Janousek, wastewater operations supervisor, moved up last year from an operations and maintenance role. "He is a really good all-around performer," Griffin says. "He really digs into problems. He does the research and comes up with solutions. He'll say, 'We're having this problem, but I think this will fix it.'"

Operator Ken Brotherton is an effective troubleshooter whose previous background as an electronics technician comes in handy when a piece of equipment gives an alarm or a process is upset. Operator Shane Cox is a maintenance specialist with an appetite for knowledge. Operator Roger Kibad is "a solid performer all around and a very sharp individual," Griffin says.

Janousek, Brotherton and Cox have attained Level 4 (highest) wastewater operator certification; Kibad is expected to reach that level soon. Newer team members are operators Alan Trujillo, Lorenzo Sandoval, John Kunko and Clayton Murrish.

The city has to compete for talent with oil field companies in the area that pay significantly higher wages. "We're listed on the job boards such as indeed.com and governmentjobs.com," Griffin says. "We also advertise in our newspaper, and we've had quite a few inquiries by word-of-mouth. The last three people we hired came to us that way and are working out great."

TAKING OWNERSHIP

The team has a knack for pulling together in the face of challenges. A year or so ago, staff turnover left the team six people short. The remaining team members juggled work schedules, took on extra shifts and kept everything running. "That included doing the maintenance work orders, mowing the grass, washing down the buildings," Griffin recalls.

"We all talked it over. Some of us did shifts we didn't really care for. Everybody worked with everyone. I need to give an honorable mention to Alan Trujillo, because he was rock solid on filling in. He and Roger Kibad took on weekend and evening shifts and really helped us out."

In his leadership role, Griffin believes in letting the team members take ownership of the facility: "I call it sweat equity. There has been a lot of blood, sweat and tears invested in this plant. I basically let the employees do what they need to and give them what they need to do it: 'What do you need from me? Do you need tools? Parts? Support? A piece of rental equipment? Here it is. Let's get it done.'"

That seems to be working just great so far. tpo

> "The reclaimed water is clear enough coming out of the plant that if you're in a boat, you can see 6 feet down through the water to the liner on the bottom of the pond."
> **BILL GRIFFIN**

Alan Trujillo, control operator, shown with the facility's Aerzen blower.

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TREATMENT PLANT ISOLATION

Meet the 'QuaranTeam'

Witnessing people's selflessness is often the silver lining amid crises. It's no surprise that the water/wastewater industry has seen its fair share of people rising to the occasion during the COVID-19 pandemic. Some operators have gone as far as quarantining themselves in the plant for multiple weeks to ensure safe water for their communities.

tpomag.com/featured

OVERHEARD ONLINE

"Essential back-end workers deal nonstop with the threat of not only COVID-19, but hepatitis, typhoid, paratyphoid, bacillary dysentery, gastroenteritis and cholera, but they do not receive praise."

Letter Praises 'Back-End' Sewer and Water Workers

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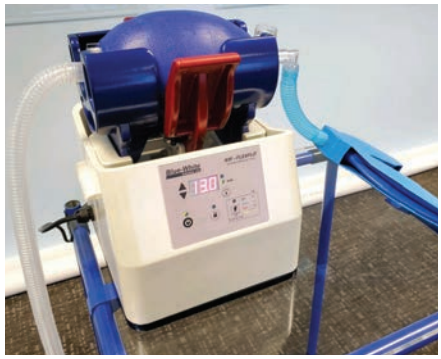
RISING TO THE CHALLENGE

Developing a Ventilator



When officials in Huntington Beach, California, became concerned whether enough ventilators would be available to treat an anticipated surge in COVID-19 patients, the city turned to Blue-White Industries — a local manufacturer of chemical metering pumps, flowmeters and water treatment accessories — to develop and build temporary ventilators.

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BUG OF THE MONTH

Learn About Flagellates

In a new series called Bug of the Month, we're spotlighting the organisms present in wastewater microbiology. Each month a new organism is featured, giving readers a profile of the species and how it functions in a wastewater treatment setting. In this peek under the microscope, take an up-close look at flagellates.

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The wastewater treatment plant in Trinidad, Colorado, stands in the high desert at about 6,000 feet above sea level.

The Right Connections

A COLORADO PLANT REAPS 38% ELECTRICITY SAVINGS AND RAPID PAYBACK WITH A PROJECT COMBINING TWO SEPARATE BLOWER SYSTEMS INTO ONE ALL-PURPOSE PACKAGE

By Steve Lund

When Jacobs took over operations of the wastewater treatment plant in Trinidad, Colorado, the team quickly found that the aeration system was significantly overpowered.

"We had two different systems where we would inject air," says John Kipp, project manager.

One system, providing air to the digesters and a waste activated sludge tank, had two blowers (75 hp and 90 hp) that ran alternately. The other system, feeding the aeration basins, had three 150 hp blowers that ran alternately.

"The blowers supplying the aeration basins were oversized and were producing too much air that was being wasted," Kipp says. "We did the math and figured out that if we connected the two blower lines, one blower motor would be large enough to supply air for all the facilities."

MAKING THE HOOKUP

Connecting the two systems required nothing more than 200 feet of 6-inch steel blower line. A Jacobs regional maintenance crew welded the line and had it operational in about eight days. The staff analyzed power usage for the five months before the change and the five months after and found a 61,900-kWh reduction in power consumption — 38%.

"The capital cost for the city was low," Kipp says. "The city will be able to make its investment back in two years or less. It's a very good return." The change also cuts down on maintenance, as two motors and blowers no longer need to run.

SUSTAINABILITY AWARD

The savings were significant enough that the Trinidad plant received the 2019 Sustainability Award from the Rocky Mountain Water Environment Association, which recognizes "system thinking, design practices, management practices and infrastructure systems that not only sustain the utility, but society as well."

Members of the Jacobs regional maintenance team work on the pipe to connect two aeration systems.

The 75 and 90 hp blowers that are now offline are still available as backups, but now all the aeration is accomplished with the three 150 hp Hoffman & Lamson, by Gardner Denver blowers with Baldor-Reliance motors, only one of which runs at any time.

Trinidad, in the high desert at 6,000 feet of elevation, lies about 200 miles south of Denver, near the New Mexico border. The treatment plant (2 mgd design, 1.2 to 1.4 mgd average) serves about 10,000 people, mainly in the city, and some septage haulers.

The finished blower line connects two systems to supply the aeration basins, the aerobic digesters, and a waste activated sludge tank from a single set of blowers (Hoffman & Lamson, by Gardner Denver).

The treatment process consists of screening and grit removal, aeration, clarification and UV disinfection. The effluent discharges to the Purgatoire River. Biosolids are sent to a centrifuge, on-site drying beds and then a city landfill.

The Jacobs staff of six is responsible for the plant and the collections system, which includes 66 miles of gravity mains, 6 miles of force mains and seven lift stations. "We all do some cross-training and cross-working," Kipp says.

> "The city will be able to make its investment back in two years or less. It's a very good return."
> **JOHN KIPP**

SAVING FUEL

The blower project isn't Trinidad's only sustainability effort. In its award application, the staff cited a successful recycling program for paper, plastic, cardboard and cans, but the program has been suspended because the recycling contractor went out of business. The staff is also working on setting up a RightCycle program for disposable gloves, sponsored by Kimberly-Clark.

Meanwhile a fuel conservation program for generators, vehicles and equipment has cut fuel consumption by 15%. "We just started tracking our fuel," Kipp says. "We reduced trips and combined trips. If we have to run to get a part, maybe we wait until we need a few parts to make a longer trip. It's just keeping an eye on it. We also don't like to let vehicles idle."

Those efforts pale in comparison to the results from combining the aeration systems. The sustainability award was just for the blower project. "That's a big cost savings that will be here forever," Kipp says.

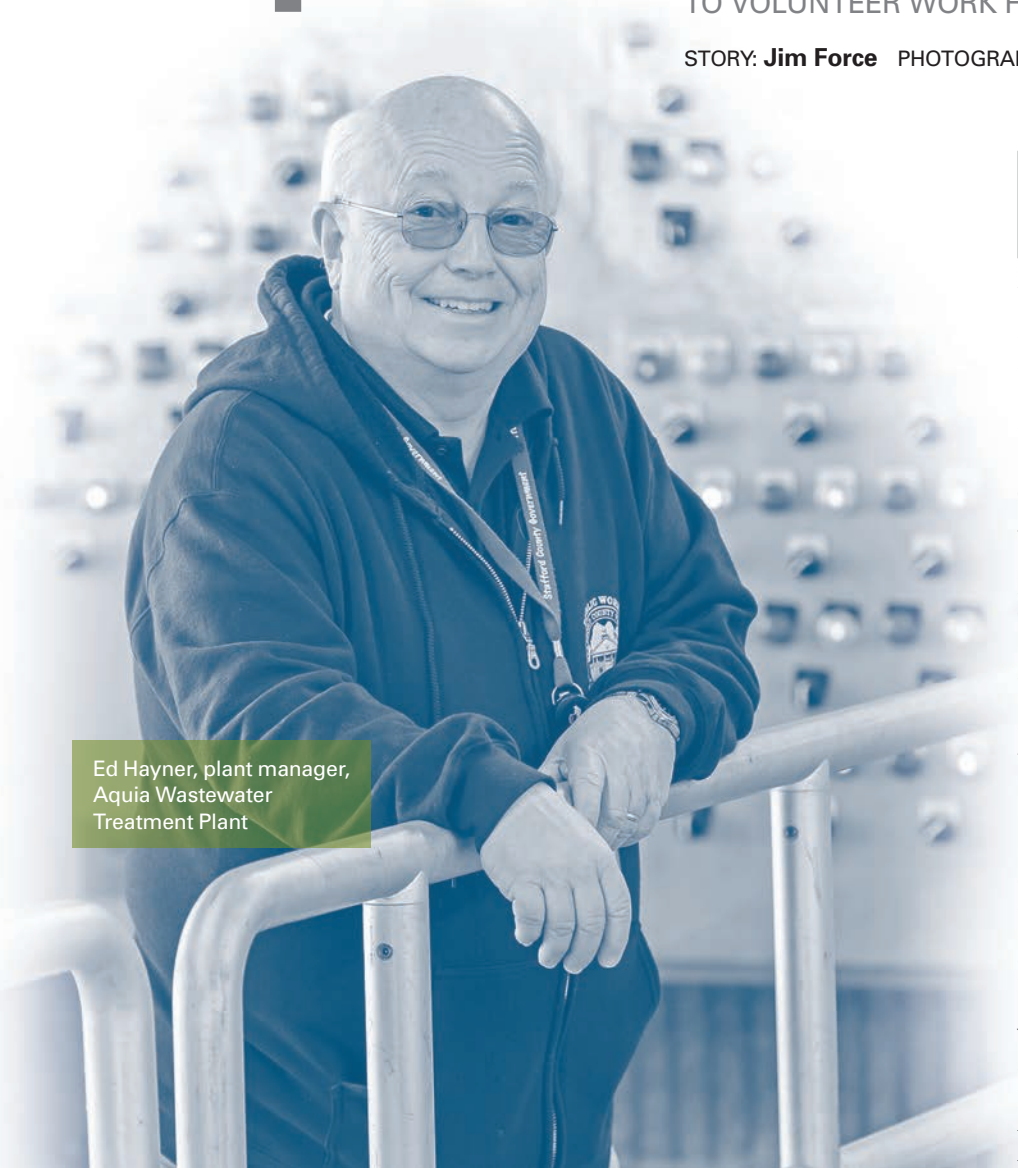
CH2M began operating the Trinidad plant in 2017; that company merged with Jacobs in early 2018, and the blower project began soon after. Kipp, who previously worked at a different CH2M project, came to Trinidad in early 2019, just as the project was getting underway.

"When we go in and help cities run these facilities, we always look for ways to save money, innovate and think of good ways the city can use its capital improvement budget," Kipp says. "We figured out how much air the blowers were putting out and how much air all five tanks needed, and we saw there was a good niche to combine the two systems. The Jacobs regional maintenance team was able to do the job, and now we're all seeing the benefits of it." tpo

Community Spirit

HATFIELD AWARD-WINNER ED HAYNER BRINGS THE SAME SELFLESS ATTITUDE TO HIS PLANT MANAGER ROLE AS HE DOES TO VOLUNTEER WORK FOR THE LOCAL FOOD PANTRY

STORY: **Jim Force** PHOTOGRAPHY: **Kevin Blackburn**



Ed Hayner, plant manager, Aquia Wastewater Treatment Plant

Ed Hayner is committed to service.

He sees his role as plant manager at the Aquia Wastewater Treatment Plant in Virginia as providing a clean-water environment for his customers. In his spare time, he and his wife volunteer at a food pantry.

Hayner credits his 2018 William D. Hatfield Award from the Virginia Water Environment Association to his operations team. "I started out in this field as a way to make a living," he says. "It has progressed to the point of giving something back to the community."

Bruce Jett, assistant plant manager, observes, "Ed is dedicated to the plant, to the system and to the environment. He sets goals, and there are not very many we don't attain."

Hayner is from the Fredericksburg area, site of the Aquia plant, owned by Stafford County. After high school, he earned certification for maintenance and service of refrigeration and air conditioning systems and worked in the Springfield area, near Washington, D.C.

Wanting to get closer to home, he joined the wastewater treatment profession by signing on to the staff at Fredericksburg in 1986; then he spent a year at Prince William County and another year at the water plant in Hanover County.

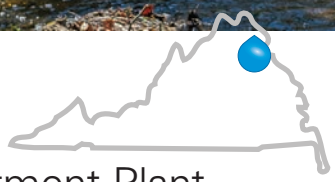
"I started out as a trainee and then took the courses and did all the things I was supposed to do," he says. "When Stafford County started up its Aquia facility in 1991, I joined the staff there." He has been with the county for 29 years.

HIGH PERFORMANCE

The Aquia plant (10 mgd design, 5.1 mgd average) treats wastewater from the northern part of Stafford County, about 40 miles south of the nation's capital. Some 55 pump stations move the water to the plant, which serves about 60,000 residents. A small fraction of the flow comes from the western portion of Marine Corps Base Quantico.

Hayner (left) and Bruce Jett, assistant plant manager, do a spring check on the discharge pipes. They appreciate seeing fish and other wildlife near the discharges because it confirms they are putting out the best possible product for the environment.

"We've gone from making water clean to making it very clean. ... We have fish in our effluent; herring and shad swim up our effluent stream."
ED HAYNER



Ed Hayner, Aquia Wastewater Treatment Plant

Stafford County, Virginia

POSITION:
Plant manager

INDUSTRY EXPERIENCE:
33 years (29 with Stafford County)

DUTIES:
Leads a staff of 15 at 10 mgd treatment facility

EDUCATION:
Certification in refrigeration and air conditioning system maintenance

CERTIFICATIONS:
Class 1 wastewater operator; Class 1 and 2 water operator

AWARDS:
2018 William D. Hatfield Award, Virginia Water Environment Association

GOALS:
Leave plant and staff in best possible shape to meet future requirements

In 2011, the plant was upgraded to a three-train enhanced nutrient removal system (Schreiber) to comply with the Chesapeake Bay watershed treatment guidelines. Influent flows through mechanical bar screens (Headworks International) and grit and grease removal chambers before passing to the enhanced nutrient removal process.

The Schreiber counter-current low-load system employs aerated and anoxic zones to achieve nitrification-denitrification, plus internal mixed liquor. The three separate trains provide redundancy to take one train down for service without exceeding permit limits.

FEEDING THE HUNGRY

Ed Hayner's devotion to service is evident in his volunteer work at The Storehouse Ministry in Fredericksburg, Virginia.

Each week, he and his wife, Juanita, help with The Storehouse food pantry, collecting and distributing food to 150 to 200 families. The Storehouse is the largest free food distribution center in Fredericksburg and is managed by Promised Land Praise and Worship Center as a core outreach ministry.

Members of a number of churches work together at The Storehouse, distributing food twice weekly to senior citizens and others. The center interacts closely with area business leaders through employee food drives and other service projects.

"My wife and I travel around to area stores to pick up food and help distribute it on Tuesdays and Thursdays," Hayner says. "We like helping people out. Some are down on their luck and are struggling. I feel like we're showing them there's still hope, that there's a better way."

The Hayners and other volunteers make the food pantry run, of course. "We're all volunteers," says Charles (Pastor Charlie) Oliveri, The Storehouse manager. "Our motto is 'No one can do it all, but together we can get it all done.'"

ABOVE: Ed Hayner checks over the SCADA system. LEFT: Hayner and David Danner, left, senior operator, check on one of the 90-plus pump stations spread across Stafford County.

> "I've known Ed for 20 years. ... He inspires us to do the best we can to make sure our plant meets and exceeds the state guidelines."
> **BRUCE JETT**

"It's a very consistent process compared to some I've had experience with," Hayner says. "It's very forgiving. With our high flows, we just need to keep our biomass at a certain level."

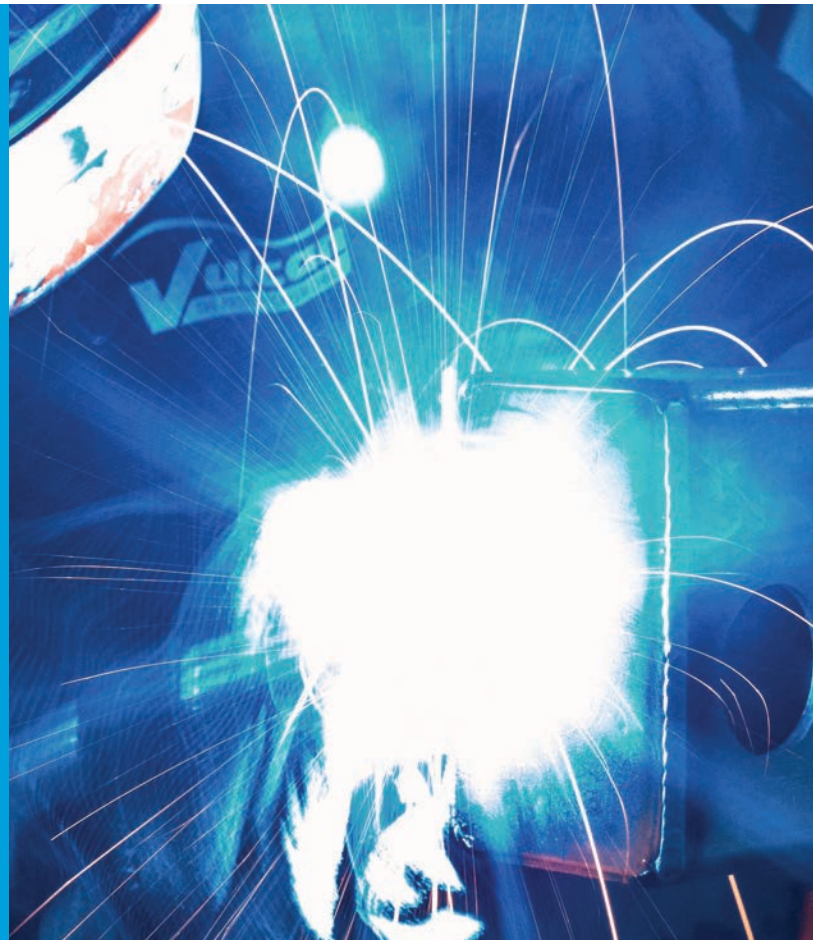
Solids settle out in the secondary clarifiers, and chemicals are added to remove phosphorus to less than 0.18 mg/L.

The clarified water is polished in AquaDisk sand filters (Aqua-Aerobic Systems). A TrojanUV3000Plus UV system (TrojanUV) disinfects the effluent before discharge to Austin Run, which flows to the Aquia Creek and ultimately to the Potomac River.

Biosolids are aerobically digested and dewatered to an 18% solids cake on centrifuges (Alfa Laval and Andritz). The material (920 dry tons per year) is hauled to landfill by county staff. The plant runs on a Lord and Co. SCADA system. The plant staff uses a computerized maintenance management system (Dude Solutions).

LOW NUMBERS

The Chesapeake Bay effluent guidelines were enacted to alleviate pollution and algae buildup in the 4,400-square-mile estuary between Virginia and Maryland and require exceptional performance, especially on nutrients.



Hayner's plant must meet seasonal ammonia limits of 2.1 mg/L from November to March and 1.0 mg/L from April to October. The plant's numbers are better than that: The weekly effluent averages are 1.0 mg/L for TSS, 2.0 mg/L for CBOD, 0.50 mg/L for total nitrogen, 0.10 mg/L for total phosphorus, less than 1.0 mg/L for nitrates and nitrite, and 0.2 mg/L for ammonia.

Hayner attributes the results to the plant expansion and extra capacity and to commitment from the staff of 11 operators and two mechanics. "It's not just me," he says. "It's the staff. Our mentality is we work together as a team to put out good effluent."

Team members in addition to Jett are David Danner, Travis Farmer, Thomas Louden and Brad Horner, senior operators; Robert Fitzgerald, Ronald Holbrook, Howard Carter and Mark Jackson, plant operators; Joseph Richardson and Justin Christman, solids handling operators; Ron Bates, head mechanic; Chad Perry, mechanic; and Jon Brindle, pretreatment coordinator.

Hayner makes a practice of communicating with the staff each day; he holds a staff meeting each month to go over items that need attention. An example is the utility's FOG program, which the staff developed under Brindle's leadership. Inflow and infiltration issues have led to the lining of more than 9 miles of sewer pipe. "We figure things out," Hayner says.

Jett endorses Hayner's approach. "I've known Ed for 20 years," Jett says. "He steps up to the plate. As a team, he inspires us to do the best we can to make sure our plant meets and exceeds the state guidelines."

Hayner returns the compliment: "Bruce is very valuable. He has an in-depth knowledge of the treatment process. Together, we are learning every day how to do things better. You're never too old to learn."

BIG CHANGES

Since he joined the wastewater treatment profession, Hayner has witnessed significant changes.

"We've gone from making water clean to making it very clean," he says. "Industry standards used to be 30-30. Now we've dropped down to 5 or 6. We have fish in our effluent; herring and shad swim up our effluent stream. We have fish eggs in the effluent trough. We didn't see that 30 years ago."

His biggest challenge is succession planning — or as he puts it, "maintaining service after us old guys leave." The staff conducts tours regularly, and one of the goals is to interest young people to join the profession or to assume future leadership positions that can provide adequate funding so that treatment plants can provide the quality of water expected of them.

"We have some pretty bright people working for us, and they should be able to carry on the torch," Hayner says. "We need to make sure we are leaving things in good hands."

His personal objective as he nears retirement? "Keep going the best I can and provide the replacement equipment as needed. It's not about Ed. It's about the staff and the plant I leave." tpo

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A Springboard for Water Careers

THE GREAT LAKES WATER AUTHORITY'S AWARD-WINNING APPRENTICESHIP PROGRAMS ARE HELPING TO FILL THE PIPELINE WITH WELL-QUALIFIED TEAM MEMBERS

By Sandra Buettner

The Great Lakes Water Authority's three apprenticeship programs in Michigan are helping to resist the wave of retirements sweeping the industry.

The initiative started in 2017 with the electrical instrumentation control technicians-instrumentation (EICT-I) apprenticeship; 20 apprentices are now enrolled. A program for maintenance technicians launched in 2018, and an electrical instrumentation control technician-electrical (EICT-E) apprenticeship began this year.

All apprentices work one-on-one with a journey worker for the duration of their course study and on-the-job training. The apprentices' ages range from 19 to 61; 59% are under age 36, and 21% are women.

The authority's efforts have earned a National Environmental Achievement Award for workforce development from the National Association of Clean Water Agencies.

THE NEED FOR TRAINING

The authority provides water and wastewater services to some 4 million people across 112 member communities in eight southeast Michigan counties. One-fourth of those residents live in Detroit and the rest in the suburbs.

> "Great Lakes Water Authority is the sponsor of the programs, but our partners are sitting right there with us, helping us to shape the program and determining what it is going to look like."
> **TERRI TABOR CONERWAY**

Terri Tabor Conerway, chief organizational development officer, says the apprenticeships were developed in response to workers leaving for retirements and other reasons. In recruiting their replacements, authority leaders found that applicants lacked the right training and skills they needed. Therefore, in 2017, they decided to cultivate their own workforce.

The authority works on the apprenticeships with several community partners. Focus: HOPE, a Detroit-based nonprofit, provides education and training to help underprivileged people in the area prepare for good-paying jobs. Candidates must be at least 18 years old, have a high school diploma or equivalent, have a driver's license and pass a drug test.

Focus: HOPE advertises the apprenticeships, processes applications and decides how many candidates to accept in the preapprenticeship part of the

The Great Lakes Water Authority apprentices are on track to earn good-paying jobs and help the Michigan authority maintain a well-qualified staff.

The apprenticeship programs earned the authority an award from the National Association of Clean Water Agencies. Pictured from left are Ted Henifin, NACWA awards committee chair; Terri Tabor Conerway, the authority's chief organizational development officer; and John Sullivan, NACWA past president.

LaRico Andres (left) and Bilal Bell-Muhammad graduated from the electrical instrumentation control technician apprenticeship program in April 2020.

program, which lasts 11 weeks. Acceptance requires successful completion of a general math and English assessment. After they complete the preapprenticeship program, they can be considered for an apprenticeship; if accepted, they start earning a salary.

MEETING STANDARDS

Once hired, the EICT-I and maintenance technician apprentices take classes at night with the authority's education partner, Henry Ford College, while working a 40-hour week training at an authority facility. The authority pays the tuition and book fees.

The Michigan Department of Labor was deeply involved in creating and administering the program to ensure compliance with rules and regulations related to on-the-job training, safety and education hours. The third partner is the union that represents the apprentices based on their classification.

"Great Lakes Water Authority is the sponsor of the programs, but our partners are sitting right there with us, helping us to shape the program and determining what it is going to look like," Tabor Conerway says. "We follow the Department of Labor standards."

A TRIO OF CHOICES

Apprenticeship candidates have a choice of various programs. The EICT-I program had 20 apprentices as of last March. All candidates in the three-year program graduated in April 2020.

The maintenance technician apprenticeship is a program that lasts three years and 10 months and had seven enrollees as of March. The new EICT-E apprenticeship lasts five years. Twenty candidates are enrolled. For programs that require certifications or licenses, apprentices receive training and the authority covers the costs. Through tuition reimbursement, the authority encourages apprentices to complete associate degrees.

Tabor Conerway notes that the authority has to compete to retain its well-trained workers because the car manufacturers and other utilities offer higher salaries: "What we found is that if we groom and train them well, they'll give us at least three to five years of dedicated service."

LESSONS LEARNED

One major takeaway for authority leadership is the importance of pulling all the partners together when kicking off a program. Tabor Conerway observes, "When you have all the apprentices, journey workers, our leadership team, the Department of Labor and union representatives in the same room, everyone hears the same information. It's very impactful to the apprentices to realize the part everyone is playing to help them succeed." tpo

'A Group Effort'

AN AWARD-WINNING SUPERINTENDENT SHARES CREDIT WITH HER TEAM FOR A WISCONSIN CLEAN-WATER PLANT'S CONSISTENT QUALITY PERFORMANCE

STORY: **David Steinkraus** | PHOTOGRAPHY: **Mark Hertzberg**

Mary-Frances Klimek, plant superintendent

The Racine Wastewater Treatment Plant is on the shore of Lake Michigan.

The Racine (Wisconsin) Wastewater Treatment Plant has occupied a 21-acre site on the west shore of Lake Michigan since 1937. Plant leaders today face challenges that include finding and training the next generation of operators and dealing with changed influent flows in an old industrial city.

"Our biggest problem is finding qualified people," says Mary-Frances Klimek, superintendent of the Racine Wastewater Utility. "I didn't realize the negative connotation wastewater sometimes has and didn't understand why plants are rebranding themselves." But she sees it when her help wanted ads draw few or no applicants.

The utility faces tough competition for hiring. Racine is about 35 miles south of Milwaukee and is part of the urban strip that surrounds the southern shore of Lake Michigan, taking in Greater Chicago. Nearby municipalities seek the same people, as do industries such as We Energies, the local electric utility.

Those challenges aside, Klimek is proud of the team she leads and shares with them the credit for her 2019 William D. Hatfield Award from the Central States Water Environment Association. "We're such a family here," she says. "I'll joke that we're like brothers and sisters. One of the requirements of the award is that your plant is operating the way it's supposed to and you're meeting your permit. That is definitely a group effort."

CONVENTIONAL PROCESS

The Racine plant (36 mgd design, 24 mgd average) was upgraded in the 1970s and again in 1990 with a 2.7 million-gallon equalization basin. A major upgrade in 2005 added another 2.7 million-gallon equalization basin, a digester with a gas-holding cover, a new solids handling building, four more primary clarifiers (for a total of 12), three more final clarifiers (total of nine) and a change from chlorine to UV disinfection (TrojanUV).

Influent passes through bar screens (Vulcan), grit collectors (Smith & Loveless) and the primary clarifiers, where a cationic polymer creates floc and ferric chloride is added to remove phosphorus. Water then moves through a conventional activated sludge process and on to the secondary clarifiers. Disinfected effluent is discharged to a dispersal structure 500 feet offshore in Lake Michigan.

Sludge from the primary and secondary clarifiers goes to four anaerobic digesters. A 40-foot-diameter sphere near the digesters also holds biogas. Three biogas-fueled Waukesha engines (two 426 hp and one 675 hp), which are INNIO products, power the Roots aeration blowers (Howden); biogas also fuels the boilers used for heating. About half of the plant's energy comes from biogas.

In the biosolids building, a gravity belt thickener and six belt presses (all Alfa Laval) dewater biosolids to about 22% solids, which

"We need to tell people what we do or otherwise no one understands. Until we do that, we will struggle with finding qualified people."
MARY-FRANCES KLIMEK

The facility's sphere holds compressed biogas that is 64-67% methane. It is used in engines that power the aeration blowers and in boilers for building heat.

The Racine treatment plant is challenged by changes in influent flow from an old industrial city.

Racine (Wisconsin) Wastewater Treatment Plant

www.cityofracine.org/wastewater

BUILT:
1937; upgrades in 1970s, 1990 and 2005

POPULATION SERVED:
130,000

SERVICE AREA:
70.9 square miles

FLOWS:
36 mgd design, 24 mgd average

TREATMENT LEVEL:
Secondary

TREATMENT PROCESS:
Activated sludge

RECEIVING WATER:
Lake Michigan

BIOSOLIDS:
Land-applied by contractor

ANNUAL BUDGET:
$10.25 million (operations)

are land-applied by contractor Synagro Technologies. Another building provides six months of biosolids storage.

The two equalization basins help with the large flows that accompany intense rainstorms. "You would be amazed the number of times we fill those tanks almost to the top but don't have them overflow," Klimek says. There are also three smaller storage tanks in the collections system. A diligent maintenance program keeps the collections system reasonably free of FOG.

MEETING THE CHALLENGE

"The biggest operational challenge we face is the strength of what we receive into the plant," Klimek says. "If the water going to aeration doesn't have a high enough concentration of the nutrients that the organisms need, they don't thrive."

That problem has existed for about 15 years. Racine is still an industrial city, home to the Case agricultural equipment company and SC Johnson, maker of household products such as Glade air fresheners and Windex window cleaner. But Case has reduced its manufacturing presence and other companies have closed.

That doesn't explain the entire change: Many companies have cut the volume of their discharges. "And that's a big deal for industry," Klimek says. "If they can use less water and discharge less water, or reuse water, then it's less costly for them."

Part of the solution to reduced waste strength is a gate that operators can close to shut off the flow to six of the primary clarifiers. Less organic matter settled out in the clarifiers means more food for the microorganisms in the aeration basins.

A LEARNING GROUP

The Racine team includes:

- Keith Haas, general manager, and Mike Gitter, chief of operations
- Supervisors Bruce Bartel, Drew Dennerlein, Amanda Kaminski, Dan Mason and Steve Stiles
- Operators Emilio Gonzalez, Travis Gonzalez, Joel Gross, Barry Henkel, Robert Johnson, John Hohensee, Warren Nordgren, Mark Salinas, Walter Spurlock and Sebastian Stephens
- Operators in training Jeffrey Johnson, Emily Nurmi and Francisco Quiroz
- Lab chemists Bobbi Kramerand and Jamie Munizand; lab technicians Demi Fohl and Eric Kamps
- Sample crew members Michael Hassenauer, Jamie Rauch and Chris Reinhold
- Electrician Ed Emmerling; mechanics Douglas Bohl, Glenn Hansen, Mark Knuth, Edward Muniz, Jake Pfeffer, Wayne Raffelson, Lee Ledeker, H. David Smith and Mark Gable

IT'S NOT ABOUT MONEY

"As we hire a new generation, there's change driven by what different generations are looking for," says Mary-Frances Klimek, superintendent of the Racine (Wisconsin) Wastewater Utility. "We try to be very aware of what the more seasoned generation wants as well, because you don't want them to feel like you're changing something and now they don't like that."

At the moment, the plant staff is discussing whether the shift schedule could change to something better, she says. Operators rotate shifts every five weeks. The plant is staffed around the clock. Every team member has a partner, always a senior worker with someone less experienced. Some longtime team members are comfortable with that, Klimek says, but she is also trying to balance the needs of younger staffers.

"Years ago, I was the operations supervisor at the time, they sent us all to generational training. I will be totally honest: I listened to it, and I thought, This is not true." Then she returned to her job and began observing people from different generations. "And the next time they sent me to that training I thought, Boy, they've got this figured out." She sees the differences in the four generations in her own family.

Although municipal jobs offer stability, that is more important to older generations, Klimek observes. Younger people want the flexibility to go somewhere else or do something else. When she asks younger team members why they're leaving, a frequent reason is that the new job has a shorter commute.

Millennials, she observes, are less interested in working a lot of overtime. "But I also am a person who says the millennials probably have it right. That work-life balance is very important to them, and I think it has shown some of the baby boomers, and it has shown me as a Gen Xer, that it's a good thing."

In the same vein, millennials don't seem to be as money-driven as other generations. Again, according to Klimek, that seems related to seeking a good work-life balance.

The engine room at the plant includes biogas-fueled Waukesha engines (INNIO), which power the Roots aeration blowers (Howden).

Racine Wastewater Treatment Plant PERMIT AND PERFORMANCE	INFLUENT	EFFLUENT	PERMIT
BOD	93 mg/L	10 mg/L	30 mg/L
TSS	88 mg/L	7 mg/L	30 mg/L
Phosphorus	2.2 mg/L	0.7 mg/L	0.86 mg/L

- Sewer maintenance workers David Moten and Owen Van Swol
- Buildings and grounds specialists Brian Felton and Kevin Stephens
- Administrative assistants Evelin Garcia and Jena Kohlman

To help build a new-generation workforce, the utility established an internship program. Internships last three years; core courses are offered through Moraine Park Technical College, which offers online instruction that is convenient for interns on shifts that don't match typical college class schedules. Six people have completed internships so far; the utility has hired three.

The utility pays for the required courses despite the uncertainty of getting a new team member out of the arrangement. Klimek observes, "We've always said, 'You aren't promising us you'll stay here, and we're not promising you that when you're done there will be a position open. We're going to try really hard because we're training for ourselves, but sometimes we're training for the industry.'"

Seasoned team members benefit as well because interns sometimes ask questions in ways they had not thought of. In addition, being reminded of basic knowledge sometimes helps experienced workers solve problems, Klimek says.

The utility has expanded public relations as part of recruitment. "We need to tell people what we do or otherwise no one understands," Klimek says. "Until we do that, we will struggle with finding qualified people. None of us ever thought we'd work at the wastewater treatment plant."

TRAINING UP

Plant workers take part in the annual environment fair at Gateway Technical College, and they talk to high school students about water careers. All seventh graders in the local school district used to have tours coupled with a classroom presentation written by two teachers, but that program was a casualty of school budget cuts. Klimek would like to reinstate it.

She also does not discount the value of welcoming people on the spur of the moment. "A couple of days ago, two kids came down the hill from up in the neighborhood — not little kids, maybe 18. I walked out and I said, 'Hey, what are you guys doing? Would you like a tour?' One of them wasn't interested, but the other was."

On the training front, Klimek believes in a multifaceted approach. "I want people to leave here," she says. "I don't mean I want them to go work

Mary-Frances Klimek gives her team credit for her 2019 William D. Hatfield Award. She was also named Mentor of the Year by Empowering Women in Industry in 2019.

somewhere else. I mean I want them to take a day and go to a training, go to a conference or learn about something they're interested in."

In September 2019, the utility sent a crew to the Water Environment Federation's Technical Exhibition and Conference on a bus sponsored by the Wisconsin Wastewater Operators' Association. For a day, they attended technical sessions and wandered the exhibit hall to talk to vendors and learn. "That's huge — to be able to talk to the person who can actually help you," Klimek says.

Another learning experience came when the lab acquired an Olympus microscope that can be linked to a laptop computer, allowing groups of people to view images simultaneously. The old microscope was shifted to an outbuilding. On weekends when the lab is closed and the microbiologist is off, operators can still look at sample slides to see what is happening in the plant processes.

Klimek observes, "We are fortunate in that we have a plant that runs really well because we take care of it very well." tpo

(See ad page 19)

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WASTEWATER

By Rick Lallish

What is the correct way to express the organic loading rate on a trickling filter?

A. Pounds of BOD per square foot of media per day
B. Pounds of BOD per cubic foot of media per day
C. Pounds of BOD per 1,000 square feet of media per day
D. Pounds of BOD per 1,000 cubic feet of media per day

ANSWER: D. The organic loading on a trickling filter is an important factor for proper operation. Simply, it is the amount of organic matter (BOD) fed to the trickling filter per day. We express this as pounds of BOD per thousand cubic feet of media per day (pounds of BOD/1,000 ft^3/day). When calculating the organic loading rate, take into account all the surface area of the media from the surface to the bottom (i.e., the volume of media). Do not take into account the recirculation flow, as the formula only accounts for the flow and BOD concentration. More information may be found in the Office of Water Programs California State University, Sacramento textbook: *Operation of Wastewater Treatment Plants*, volume one, eighth edition, Chapter 6.

DRINKING WATER

By Drew Hoelscher

What is the best approach when collecting a routine total coliform sample?

A. Flushing the hot-water tap for about five minutes before collecting
B. Flushing the cold-water tap for about five minutes and rinsing the bacteriological sample bottle before collecting
C. Flushing the cold-water tap for about five minutes before collecting
D. Collecting a first-draw sample from the cold-water tap

ANSWER: C. One way to monitor the quality of potable water flowing through the distribution system is to collect routine coliform samples every month. Thoroughly flushing the cold-water service line before collecting a bacteriological sample ensures that the water collected is from the distribution main. In addition, the operator should always measure and record the chlorine residual before collecting the bacteriological sample.

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

pumps drives valves blowers pipe

Skilled operators and quality products make an unbeatable combination in water and wastewater treatment plants.

See how these partnerships ensure success in this special section.

Blue-White Industries' Innovative MD-3 Multidiaphragm Dosing Pump Is a Problem-Solver

Blue-White Industries' ProSeries-M line of products has been meticulously designed and engineered to meet the specific and critical demands of municipal water and wastewater treatment.

Included in the ProSeries-M line is the hybrid Chem-Pro MD-3 multidiaphragm pump. Blue-White Industries engineers have succeeded in giving the MD-3 all the best features and capabilities of both peristaltic- and diaphragm-type pumps.

The smooth, near-continuous, pulsation-free chemical dosing of the MD-3 pump is a suitable choice when pumping harsh chemicals. The multidiaphragm pump experiences no loss of prime when dosing gaseous chemicals like peracetic acid or sodium hypochlorite.

MARINE CORPS CASE STUDY

Marine Corps Base Camp Pendleton is the major West Coast base of the U.S. Marine Corps, located on the Southern California coast in San Diego County. The camp maintains a self-sustaining water supply and sewage treatment plant serving a population of 70,000.

Camp Pendleton had been using four diaphragm metering pumps to inject sodium hypochlorite into its finished potable water to pre- and post-chlorinate the drinking water for the base. The diaphragm pumping cycle consists of a suction and discharge phase.

During the suction phase of the cycle, gaseous chemicals like sodium hypochlorite can cause vapor lock and the pump may lose prime. Priming was a challenge for the previous diaphragm metering pumps because this application required intermittent pumping through duty and standby metering pumps.

Another problem with the diaphragm pumps that were in use was the repair costs and time. The repair kit is costly (averaging around $1,200 per kit), the pump takes a full day to repair, and the work is complicated and messy.

THE SOLUTION

The diaphragm pumps in use at the facility were replaced with two of Blue-White Industries' ProSeries-M MD-3 multidiaphragm metering pumps for beta testing. The dual diaphragm configuration means that when the first diaphragm is in the suction phase, the second diaphragm is in the discharge phase, resulting in near-continuous flow. This prevents gas buildup and loss of prime even when feeding sodium hypochlorite.

Sean Donegan is a water treatment specialist with ACEPEX, a contracting firm involved with the project. "The MD-3 pumps have a smooth, consistent flow like peristaltic pumps, especially at low feeds," Donegan says. "The MD-3 pumps are less expensive than other pumps, especially when comparing spare parts cost and time to repair."

THE RESULT

The MD-3 succeeded in pumping the gas-forming chemical in the high-pressure application and eliminated vapor lock. The pumps injected 12.5% to 16% of sodium hypochlorite at the rate of 5-7 gph at 80-120 psi while maintaining an accurate and continuous flow and smooth chemical dosing. No pulsation dampener is required.

The MD-3 is equipped with Blue-White Industries' exclusive, single-layer DiaFlex polyvinylidene difluoride diaphragms. The patented, ultra-durable diaphragm is designed to last the life of the pump.

The MD-3 features a drop-in-place design for ease of installation while operator-friendly built-in controls make setup fast and simple.

"The pumps have worked perfectly since installation and are accurate and consistent," says Keith Regalado, Camp Pendleton's shift operator.

Blue-White® Industries

Blue-White Industries is located in Huntington Beach, California, was founded by Ozzie King and was incorporated in 1957. What began as a small company with only four permanent employees now boasts a workforce of more than 100 individuals, as well as a worldwide network of representatives and service centers.

714-893-8529 | info@blue-white.com | www.blue-white.com

No Lower Bearings, Sprockets, Bushings or Guides With Raptor FalconRake Bar Screen

The Lakeside Raptor FalconRake bar screen is an efficient, proven, cost-effective screen technology for inorganic solids removal, protecting downstream equipment in municipal and industrial applications.

High removal efficiency and low headloss is achieved with multiple rakes continuously removing captured material. The Raptor FalconRake bar screen features a durable stainless steel chain-link design for solids removal without the need of lower bearings, sprockets, bushings or guides, thus eliminating any fouling or jam conditions in the channel.

The Raptor FalconRake offers a wide range of bar shapes and depths to ensure successful operation regardless of the application, creating an efficient, durable, dependable and rapid debris-removal system.

DESIGN AND CONSTRUCTION

Product features include all stainless steel construction to resist corrosion and a low-horsepower, energy-efficient drive system. The unit requires minimal headroom above the operating floor.

The Raptor FalconRake offers bar spacing available from 1/4 inch and features a variable speed to ensure quality cleaning and a durable cast stainless steel chain-link system.

Customers can optionally add a cover for odor control, an explosionproof design or weather protection system, or teardrop-shaped bars for reduced headloss.

THE COMPLETE PACKAGE

The Raptor FalconRake bar screen can be used in tandem with the Raptor wash press to wash, compact and dewater captured screenings. The screen and wash press equipment controls can be integrated into one control panel for smooth and efficient operation.

LOW MAINTENANCE, HIGH PERFORMANCE

The Lakeside Raptor FalconRake bar screen operation is simple. As wastewater flows through the screen, solids are captured on the face of the bar screen. Multiple rake heads with teeth that penetrate the bar screen transport solids to the top of the unit where a debris wiper blade removes solids into a discharge chute. Materials then fall from the chute into a conveyor, washer/compactor or dumpster for disposal.

The low-horsepower, energy-efficient drive operates at low or high speed to ensure the most effective capture/solids removal in the wastewater stream. Maintenance, although rarely needed according to the manufacturer, is easily achieved at the operating floor level since no part of the drive system is located below water.

The Raptor FalconRake offers efficient, economical performance for municipal wastewater treatment plants, pump stations, surface water intake structures and combined sewer overflows.

LAKESIDE EQUIPMENT CORPORATION
Water Purification Since 1928

Cleaner Water for a Brighter Future®

Lakeside Equipment Corp. is an engineering and manufacturing company concentrating on helping improve the quality of water resources. Lakeside started engineering water purification systems for municipalities and companies throughout North America in 1928. Today, the company operates globally. For more details on the design and performance of the Raptor FalconRake bar screen, contact Lakeside.

630-837-5640 | sales@lakeside-equipment.com
www.lakeside-equipment.com

Electric Actuation Solutions Offer Efficiencies, Flexibility for Treatment Facilities

For years, pneumatic actuation dominated the heavy commercial and industrial arenas. Relying on the process of converting electricity into compressed air and a leak-prone distribution network of piping, these systems could be expensive to install and maintain.

Thanks to innovations in control systems, today's electric actuation systems remove the inefficiency and cost of pneumatic actuators and allow for a seamless, automated control system at facilities — ultimately resulting in cost savings for building owners.

HRS SERIES ACTUATORS

For municipal water and wastewater treatment facilities in search of time and cost savings, Hayward Flow Control's HRS Series electric actuators offer a dependable, customizable solution.

The HRS Series actuators are industrial quarter-turn electric actuation products suited for both thermoplastic and metal applications with a torque range of 300 to 177,000 lbf/in. They're offered from low voltage at 12-volt AC and -volt DC to complete three-phase 575 volt. Within the HRS Series, Hayward offers 16 different torque rated units and nine different frame sizes.

FULL-FEATURED BASE MODEL

While some electric actuators in the marketplace are sold in a bare-bones offering, Hayward offers a full-featured actuator as a base model. The units are standard with a NEMA 4X, IP67 enclosure and come with a color-coded and gradient-marked raised position indicator that's viewable from 360 degrees. They also fully comply with ISO 5211 standards.

In addition to the base product, Hayward offers more than 147 options to the product, including battery backup fail-safe systems, local control operator systems and custom electrical control interface solutions.

"The product is offered everywhere from the base, bread-and-butter, open-closed, 90-degree quarter turn, up to a custom-configured unit to meet a wide array of application requirements," says Jeff Jones, business development manager for Hayward.

The fail-safe battery backup component provides complete operational security and reliability for true loss-of-power fail-safe protection. When a facility loses power, the battery backup system takes control and will position the actuator to the preselected position of the user's choice. Upon return of the building's main power, the backup system will automatically return control of the actuator to the building control system.

"That is extremely important when you deal with chemical storage," Jones says. "When power goes out, gravity is still there, so you need to be able to isolate and control your process to avoid any potential damage or danger to the operators."

CLUTCHLESS DESIGN

The epicyclic design of the HRS Series means no clutch is needed to operate the manual override system, eliminating a high-wear and high-failure component that many actuators in the marketplace rely on. This also creates a safe environment for the operator, who can operate the hand wheel at any time without having to engage a clutch.

When it comes to local control stations, Hayward offers four different styles, varying from knob control to push-button control to LED or LCD interface screens. All are equipped with illuminated visual indicators of power and alarms.

Designed to provide years of service in the most rugged, harsh industrial environments, Hayward's actuators are suited for chemical processing, waste and water treatment, power generation, marine, oil and gas, and more industries.

HAYWARD®

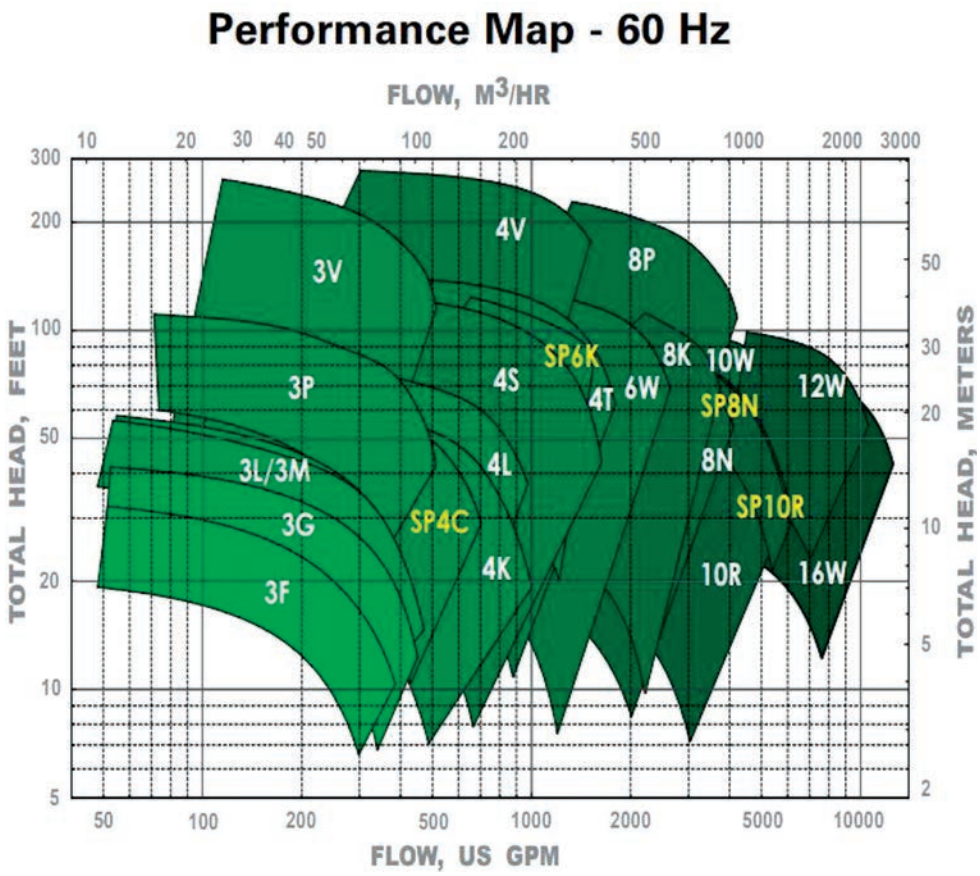
Hayward Flow Control, a division of Hayward Industries Inc., is based in Clemmons, North Carolina, and has been a leading manufacturer of industrial thermoplastic valves and process control products for more than 60 years.

888-429-4635 | hfcsales@hayward.com | www.haywardflowcontrol.com

The Science of Chopper Pump Reliability

The design principles of chopper pumps have evolved over 60 years. New ideas and concepts have come to fruition from field experience in chopping and pumping an ever-widening variety of items.

As a result, chopper pumps are able to pump a large array of solids that make their way into effluent wastewater. In treatment plants, these chopper pumps have been a crucial asset for operators who rely on consistent, minimal maintenance solids-handling pumps in critical applications.



CHOPPER PUMP DEVELOPMENT

Development of the first chopper pump began in the late 1950s when Jim Vaughan recognized the need for better pumps in local dairy waste streams, according to a Vaughan Co. spokesperson.

The pumps of the time weren't able to handle the manure, twine and animal bedding that cluttered the waste streams in the dairy fields. To solve the issue, Jim Vaughan designed a chopper pump to break down solids using a multiblade rotating impeller chopping against fixed shear bars at the suction opening. While this basic design is the foundation of chopper pumps, field experience has proven that a number of additional chopping features increase the pump's ability to eliminate clogging and binding.

TREATMENT PLANT APPLICATIONS

Ongoing engineering and field testing found an effective use for these pumps in the handling of tough solids often found at modern treatment plants. Kent Keeran, recently retired chief engineer of Vaughan, explains that Vaughan chopper pumps chop materials inside the pump rather than in front of a typical nonclog impeller.

"We also employ a number of patented chopping features specifically designed to ensure that the entrance to the pump remains free of solids entering the pump, and to ensure that both the front and back of the impeller remain free of any material that could eventually cause clogging or binding between the impeller and volute," he says.

PRODUCT DESIGN

Vaughan has spent many years refining the use of computational fluid dynamics to improve the efficiency of existing pump designs and generate new pump models. Through careful validation of CFD simulations, Vaughan has been able to bypass physical performance testing of prototypes, which allows the engineering team to test hundreds of combinations of impeller blade shapes and pump casing designs to maximize chopper pump efficiency and reliability.

The key component in this process is the nearly 60 years' chopping experience that forms the basis of knowledge, which allows the Vaughan team to accurately identify what impeller blade shapes and configurations work best for a chopper pump when considering how to run the CFD simulation process.

The final verdict for a successful chopper pump design can only be obtained in actual sewage treatment plant applications. "Vaughan Co. is very proud of the fact that through commitment to rigorous design and focused attention to customer feedback, all of the Vaughan chopper pump models operate successfully around the clock in the toughest applications found in today's sewage treatment plants," says a company spokesperson.

Unmatched Reliability
Vaughan®

Vaughan Co. Inc. is a pumping and mixing equipment manufacturer located in Montesano, Washington, that provides products for both domestic and international businesses and municipalities. Vaughan focuses on producing quality pumps and mixers for tough applications within the municipal, industrial and agricultural markets. This focus on quality means the company takes time on each project to ensure that the pumps and/or mixers are properly sized for each installation.

888-249-2467 | info@chopperpumps.com | www.chopperpumps.com

ADD A VAUGHAN CONDITIONING

PUMP TO THE MIX

Vaughan 60 years OF QUALITY AND ADVANCEMENT

The Vaughan Conditioning Pump is our Submersible Chopper Pump mounted on a portable stand and fitted with a high-velocity mixing nozzle. The Conditioning Pump recirculates wet wells, chopping and mixing to produce a homogeneous slurry that is more easily pumped out. Floating mats are removed and solids that have accumulated on the floor are re-suspended. Being portable, it can be used in multiple applications at a single job-site, facility or municipality. In one recent project, the Vaughan Chopper Pump paid for itself in 2.5 months!

APPLICATIONS

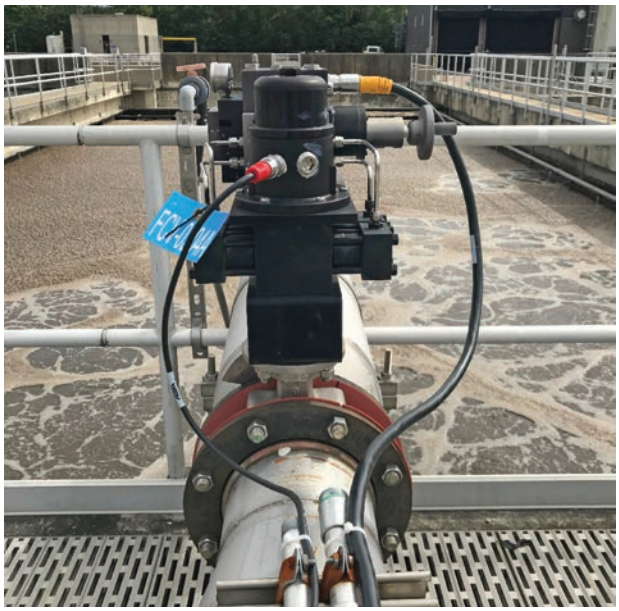
- Lift Station Conditioning
- Basin Conditioning
- Influent Station/Channel Conditioning
- Holding Tank Conditioning
- Digester Cleanout/Homogenization

CONTACT US TO SEE HOW WE CAN HELP YOUR NEXT PROJECT

Chopper CHOPPERPUMPS.COM | 360.249.4042 | INFO@CHOPPERPUMPS.COM

MANUFACTURED IN THE USA

Staying in Control With REXA Actuators



REXA actuators offer reliable control of any valve or gate service. Its electraulic technology operates like an electric actuator that employs a hydraulic transmission without the use of an actively pressurized reservoir system.

The technology eliminates maintenance burdens, liability concerns and high costs of ownership. The result is a hydraulically driven actuator designed to modulate accurately and reliably over long periods without attention.

SUPERIOR CONTROL

REXA can turn any valve or gate into an accurate flow control device. Specifically, REXA can modulate a butterfly valve close to the seat, dramatically improving the efficiency of processes such as aeration or filtration. The company can also modulate gates in collections and UV systems.

RELIABLE OPERATION

REXA is designed to reliably operate in demanding applications and during worst-case scenarios, easing worries about collections system gates moving during wet-weather events. The technology can offer operators peace of mind, assuring them that critical valves and gates will operate when called upon.

DRAMATIC COST REDUCTION

Products that operate reliably over long periods eliminate unnecessary costs. REXA can eliminate unexpected failures on demanding valve or gate services, helping users' bottom line.

REXA is a custom-designed, American-made product designed to solve problems through retrofits of existing infrastructure or in new construction.
508-584-1199 | sales@rexa.com | www.rexa.com

Delta Hybrid Compressor Prioritizes Efficiency, Reliability

Aerzen's Delta Hybrid rotary lobe compressor is an innovative solution in compressor technology, and it's among the most efficient machines by far in the vast 25 to 100 percent control range. The Delta Hybrid brings together the benefits of blower and compressor technology in one single unit with energy savings of up to 15 percent.

DESIGN AND FEATURES

Some of the key features of the Delta Hybrid are exceptional energy efficiency, reduced life-cycle costs, increased range of applications and pressures, high levels of reliability and long service life, reduced maintenance needs, and processed air 100 percent free of oil and absorption material.

Its flexible modular design means that the Delta Hybrid can be designed or retrofitted for all rotary lobe compressors and belt-driven motor sizes within a range of nominal widths if a standard solution won't do the job.

There's no absorption material to interrupt operation. Absorption materials can cause wear or reduce operational safety. To solve this, Aerzen's research and development team came up with a solution: A discharge silencer completely free of absorption material. It decreases noise purely by rerouting airflow, guaranteeing that downstream process systems won't be contaminated. In sewage treatment technology, this avoids clogs in the aeration system, and with them operational constraints and high maintenance costs.

Fix Leaking Pipes With Versatile HYMAX VERSA Couplings

The HYMAX VERSA is a coupling that wraps around damaged pipe usually repaired with the cut-and-replace technique while providing dynamic deflection to reduce the risk of damage caused by ground shifts.

Installers can simply wrap the HYMAX VERSA around the damaged pipe, and HYMAX's hydraulic pressure-assisted gasket offers a kind of shock absorber to minimize damage due to ground shifts.

AN ADAPTABLE SOLUTION

In situations where cutting pipe involves adhering to stringent environmental precautions, HYMAX VERSA installation time is a fraction of standard repair techniques since pipes can be coupled in one step without cutting pipe. The coupling can also be used for stab-fit connections, meaning that installers can use this product to make a variety of repairs no matter what they uncover in the ground.

Used for a wide array of piping materials and diameters, the HYMAX VERSA has an extra-wide tolerance of up to 1.3 inches to allow utilities to reduce their inventory by only keeping a small number of products on hand.

The coupling's weld-free construction and all stainless steel parts make it tough and resistant to corrosion. The elimination of welds is crucial since these areas are where corrosion often starts. The HYMAX VERSA's top-facing bolts and lightweight construction enable easy installation and handling with minimum manpower.

HYMAX®
Repair the past. Connect the future.
KRAUSZ is the creator of HYMAX

Krausz Industries Ltd. and Krausz USA Inc. are subsidiaries of Mueller Water Products. Krausz develops, designs and manufactures smart products for repairing and connecting different kinds of pipes for potable water and sewage. It offers a broad portfolio of solutions, including standard products that range from 1.5 to 70 inches and custom-made products according to customers' needs.

855-457-2879 | info@krauszusa.com | www.krauszusa.com

Flomatic Valves Introduces Flo-E-Centric Plug Valve Model 5400

Flomatic Valves has introduced its Flo-E-Centric Model 5400, an energy-efficient, round-port, eccentric plug valve designed in compliance with AWWA C517-16. The body, bonnet and plug (NBR encapsulated) are constructed of ASTM International A536 grade 65-45-12 ductile iron. The body and bonnet are fusion-bonded epoxy-coated (NSF 61 powder) inside and outside standard. The valve stem is equipped with V-type packing that is self-adjusting and replaceable while the valve is under pressure. The Flo-E-Centric plug valve seat and plug face are offset from the shaft centerline to provide tight shut-off and wear resistance. Flomatic's plug valves have a specially designed plug moving in and out of the seat with minimal contact, resulting in low operating torque. It is a quarter-turn valve, allowing a cost-effective solution with low torque actuation for pump control, shut-off and throttling operation.

DESIGNED FOR LONG SERVICE LIFE

Flomatic plug valves incorporate a nickel-welded seat for long service life and are designed primarily for applications where slurries, solids or grit are present. Designed for both on-off function and process control in industrial and municipal applications, Flomatic Model 5400 is available in six different configurations in a size range from 2 through 24 inches with a bare stem, operating nut, MJ plug, electric actuator, gearbox and standard ISO top-mounting flange.

FLOMATIC® VALVES

Flomatic Valves is a leading manufacturer of valve products with more than 85 years in the business. The company is dedicated to manufacturing high-quality valves that are built to last.

800-833-2040 | www.flomatic.com

Kids inspect a display of different water meters during a Splash into Spring event.

Making Big Impressions

A CALIFORNIA WATER DISTRICT SWEEPS UP FOUR PUBLIC RELATIONS AWARDS FOR ITS COMMUNITY OUTREACH AND EDUCATION INITIATIVES

By Sandra Buettner

Water-Wise Wednesdays. Succulent Sundays. Splash into Spring.

These are a few of the Elsinore Valley Municipal Water District's outreach programs that won awards last year from the Public Relations Society of America's Inland Empire Chapter. The programs' objectives range from promoting water conservation indoors and outdoors to building customer support for a new method of charging customers for service.

Based in Lake Elsinore, California, the district serves some 155,000 people in a 97-square-mile area that includes three wastewater treatment plants with a total capacity of 9.7 mgd. The district received three Polaris awards (first place) and one Capella Award (second place) from the Public Relations Society of America chapter.

MARKETING CAMPAIGN

Because its service is prone to drought, the district continually promotes water conservation and encourages its residents to take part. The Being Water Wise – Easy as 1, 2, 3 program gives customers conservation tips.

The district put in water-saving landscaping and vegetation at the city baseball stadium that's home to the minor league Lake Elsinore Storm and installed the watering system. In light of that, the staff decided to partner with the team to help get the campaign's message out.

> "Feedback from the residents on our transparency and education has been great, and the customers really enjoy the events."
> **BONNIE WOODROME**

District staff members worked with the team mascot, Thunder, and posted water-saving tips on the Jumbotron during the games. They also passed out water-saving devices such as hose shut-off nozzles, faucet aerators and low-flow showerheads. The campaign lasted the entire five-month baseball season; it earned a Polaris Award.

SOCIAL MEDIA

The district was already active on Facebook and Twitter but wanted to widen its outreach to a younger audience. Instagram is more popular among millennials and is photo-centric. The staff saw it as a perfect platform to promote the utility's water-saving landscape initiative.

They created Water-Wise Wednesdays and Succulent Sundays to post photos of residents' yards that were transformed from grass to water-conserving

(continued)

Nozzle mix system increases efficiency with dual-zone mixing

The JDV Nozzle Mix System is a patented dual-zone mixing technology that provides uniform mixing patterns to produce even distribution and a stable environment.

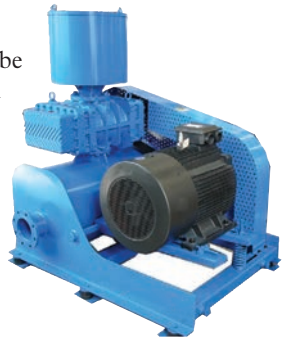
The JDV Nozzle Mix System optimizes solids suspension and contact, which increases efficiency in a wide range of applications. The system is designed for easy maintenance, with pumps installed outside the tanks. The pumps are typically chopper pumps, or pumps with inline grinders, which prevent fibrous materials from accumulating and causing plugging problems. Various pumps can be used, depending on application. The high-velocity nozzles are mounted inside the tank and are positioned to discharge in a flow pattern that completely mixes the tank contents.

The mix system can be used for anaerobic digestion, biosolids storage, blending tanks, excess flow tanks, septage or leachate, anoxic zones, CSO handling, aerobic digestion, assisting secondary treatment and biosolids holding ponds.

JDV Equipment Corporation is a leading manufacturer and provider of safe, environmentally friendly processing equipment and services for water treatment, wastewater treatment, industrial and agricultural applications. The company has more than 50 years of experience and has completed more than 10,000 equipment installations.

973-366-6556 | sales@jdvequipment.com | www.jdvequipment.com

Eurus Blowers Provide Significant Pneumatic Conveying Features



Eurus MB series bilobe and ZG series trilobe blowers are rated up to 15-inch Hg vacuum (15 psig) and flows up to 5,000 cfm. Designed for the rugged and varying demands of wastewater treatment plants, the blowers feature an integral ductile iron shaft and impellers, oversized bearings, piston ring air seals and Viton oil seals for low blower vibration and noise.

RELIABLE OPERATION

Critical components, including the motor, are selected site-specific, and users can expect dependable operation whether it's used as a system component or as part of the Eurus package. This means the complete blower skid package need not be sent to a repair facility in the event one item fails or needs rework. Critical components may be quickly replaced, substituted or repaired.

EurusBlower

Eurus Blower Inc. is a subsidiary of Shandong Zhangqiu Blower Co. Ltd. the largest manufacturer and seller of positive displacement blowers in Asia.

630-221-8282 | info@eurusblower.com | www.eurusblower.com

landscapes. Since 70% of its water is used outdoors, the district wanted to make younger people buying homes aware that these landscapes have curb appeal while using less water. As of last February, the district had 300 followers on Instagram. This effort received a Polaris Award.

SPECIAL EVENTS

The district had held one or two Water-Wise Workshops per year but increased the frequency to five or six per year because of the events' popularity. Workshops are held on Saturday mornings and last two to three hours. Topics include water conservation, irrigation and composting.

Attendees receive handbooks on transforming yards from grass to lower-water-use landscapes. Community partners such as Master Gardeners and a water wholesaler have given presentations. For rural customers in fire-prone areas, the district added a firescaping class that describes plants that can stop or slow the spread of wildfires. This program received a Capella Award.

The Elsinore Valley Municipal Water District's construction management group set up a digging activity to introduce kids to construction tasks.

Elsinore Valley Municipal Water District staff members gave out gifts with water-saving reminders during a Lake Elsinore Storm baseball game.

COMMUNITY RELATIONS

The utility had been charging a uniform rate sewer user fee to all residents, but after a rate study, the leadership decided that rates would better reflect usage if based on household size: It was critical for heads of those households to know about the change.

The district reached out to residents through billing inserts, mailings, training for customer service personnel, social media and community meetings. The campaign went on for a year, giving customers ample time to ask questions about the change and why it was necessary. As a result, the new rate system was well received. This effort earned a Polaris Award.

Another district program, in its ninth year, is a Splash into Spring event that attracts about 900 residents. All departments are involved in the three-hour free event. It includes large maintenance and sewer cleaning trucks on display, a narrated tour by wastewater treatment plant operators, a leak detection and prevention display, and a water hydrant activity for the kids. Residents receive advice on landscaping and outdoor water conservation tips along with refreshments and water-saving giveaways.

PROGRESSIVE LEADERSHIP

"Feedback from the residents on our transparency and education has been great, and the customers really enjoy the events," says Bonnie Woodrome, community affairs supervisor. "We are a leading-edge company, and our leaders and board are a very forward-moving group. We are able to create these programs and submit them for awards because of their support and encouragement for promoting water-saving efforts in our community." tpo

Lake Elsinore Storm baseball fans took part in a Being Water Wise – Easy as 1, 2, 3 promotion during a game at the city's stadium.

What's Your Story?

***TPO* welcomes news about your public education and community outreach efforts for future articles in the Hearts and Minds column. Send ideas to editor@tpomag.com or call 877-953-3301.**

Anue Water Technologies hires new sales manager, technical staff


Bob Negley

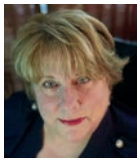

Phani Peddi


Avantika

Anue Water Technologies has hired Bob Negley as sales manager. He will be responsible for commercial affairs, working with channel partners to place the company's products. He brings 34 years of water treatment industry experience, including 12 years in industrial and commercial boiler, cooling, odor control and wastewater applications and 14 years in chemical applications for scale inhibition in water treatment, oil field, and pulp and paper.

Anue also announced the addition of Phani Peddi as technical services manager and Avantika as applications engineer. Both will provide day-to-day technical assistance to channel partners and end-user customers.

Capriotti appointed director of sales and marketing for Griffco Valve


Donelle Capriotti

Griffco Valve announced the appointment of Donelle Capriotti to the position of director of sales and marketing. She will be responsible for expanding the company's distributor network, improving working relations with channel partners, and managing marketing and advertising programs. Capriotti joins the company from Wanner Engineering, where she served as director of business development. She previously held positions as a regional sales manager for Viking Pump, business development manager for ProMinent Pumps and general manager for Durameter Pump.

GF Piping Systems announces new specialist


Edwin Gonzalez

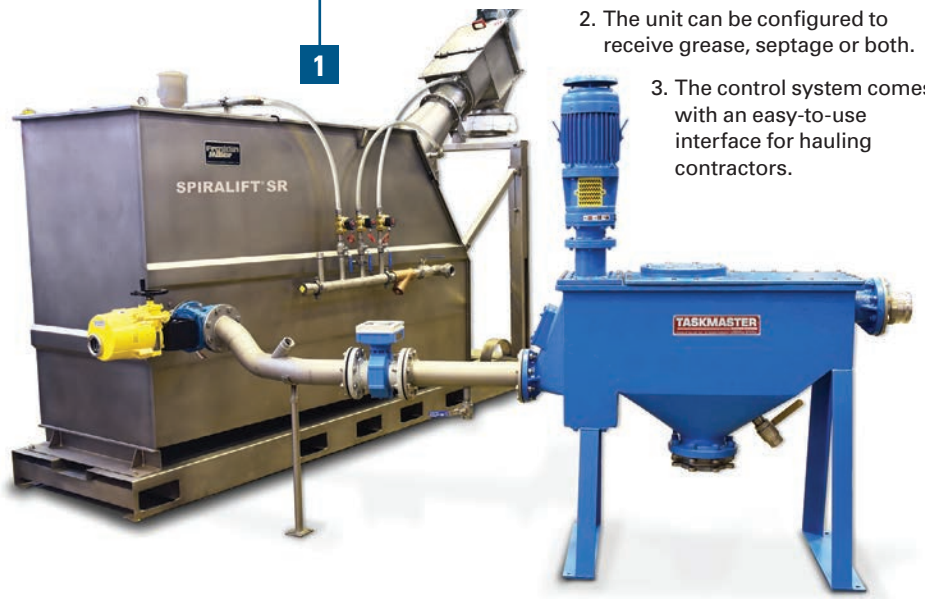
GF Piping Systems named Edwin Gonzalez, CPD, as piping systems specialist for the Southeast region of the U.S. Gonzalez brings more than 35 years of experience in plumbing system design, project management and construction. He attended Hartford State Technical College in Connecticut and Seminole State College in central Florida and earned the Certified in Plumbing Design designation from the American Society of Plumbing Engineers in 1996. He is a former chapter president and current board member for the Central Florida ASPE Chapter.

Kurita Water Industries announces merger

Kurita Water Industries announced the completion of the merger of its consolidated subsidiaries in the U.S., including U.S. Water Services, Kurita America, Fremont Industries and Global Water Services Holding Co. The newly combined company will be known as Kurita America and will be headquartered in St. Michael, Minnesota. LaMarr Barnes, former CEO of U.S. Water Services, will lead Kurita America as CEO.

Generac Power Systems names new industrial dealer

Generac Power Systems announced that Bud Griffin and Associates will represent Generac as a new distributor. BGA will represent Generac Industrial Power as an exclusive dealer in Arizona, southern New Mexico and the El Paso region of Texas. BGA is one of only 30 such distributors throughout North America. tpo



1. The SPIRALIFT SR system is easy to install; facilities simple have to make it accessible to the road for the trucks and may need to place it on a concrete pad.
2. The unit can be configured to receive grease, septage or both.
3. The control system comes with an easy-to-use interface for hauling contractors.

All-in-One Septage Handling

A FULLY AUTOMATED RECEIVING STATION COMBINES COMPLETE PRETREATMENT AND PROCESSING FUNCTIONS WITH TRANSACTION RECORDING FOR TRACKING AND INVOICING

By Ted J. Rulseh

Septage receiving is a valuable service that clean-water plants can offer to rural communities, and it can be a significant source of revenue.

A key to a beneficial septage program is a clean and efficient receiving station that makes life easy for haulers and plant personnel. In general, the more the receiving functions are automated, the better for everyone. Franklin Miller now offers the SPIRALIFT SR multifunction septage receiving system. It's a single unit that grinds, screens and conditions the flow to reduce the loading on plant processes and prepares screened solids for an economical next step.

Besides its wastewater processing functions, it authenticates users and records transactions for billing and tracking. The unit washes screenings and efficiently compacts them by up to 40%. The solids are delivered to a convenient elevation for discharge to a bin, bag or conveyor.

The unit can be configured to receive grease, septage or both. The screening system is housed in a stainless steel tank enclosure. An automated rock-removal system is optional. Bill Galanty, Franklin Miller president, and Gary Carlson, engineer, talked about the system in an interview with *Treatment Plant Operator.*

tpo: What needs is this technology designed to meet in the marketplace?

> "Our technology is essentially a pretreatment unit that makes septage easier for them to deal with. The machine grinds and screens the material, separates out the solids and eases the loading on the headworks."
> **GARY CARLSON**

Galanty: Customers have basic needs on the mechanical side and the financial side. Mechanically, they have a need to receive septage in an organized way from the hauler trucks without overloading their processes. On the financial side, they have a need to be paid accurately and reliably for receiving the material.

tpo: What is the essential benefit of a septage receiving station?

Carlson: It's very important to many customers to operate a system that can neatly and effectively process the septage. In many cases, septage haulers just dump the material into an open manhole. It goes right into the

treatment system, and it's such concentrated sewage that it can upset the balance of the process. Our technology is essentially a pretreatment unit that makes septage easier for them to deal with. The machine grinds and screens the material, separates out the solids and eases the loading on the headworks.

> "Our grinder uses a cutter cartridge technology that makes it strong and resistant to the heavy solids encountered in septage. A lot of maintenance issues are eliminated by the use of a properly designed grinder."
> **BILL GALANTY**

tpo: In basic terms, how does the process work?

Carlson: It starts with a quick-connect coupling that connects to a hose from the hauler. The first treatment stage is a rock trap. Right after that within the housing there is a coarse grinder that cuts the rags, plastics and other solids into particles. That makes the flow much more manageable for the screening equipment, optimizes washing and protects the valve. After that, we can measure the volume with a flowmeter, or the material just goes through a plug valve into the septage receiver tank.

tpo: What happens in that receiver tank?

Carlson: Inside is a spiral screen that takes out the inorganic material. Then the screenings are washed and cleaned in a very intensive spray wash system. That is very important, especially where the treatment facility doesn't have permitting to put dirty screenings into a landfill. There is also a built-in self-cleaning system for washing the interior of the tank to keep the system hygienic. The organics come out with the liquid, and that is typically piped into the treatment plant headworks.

tpo: What is done with the screenings after washing?

Carlson: The screenings are transported into a compaction area that uses proprietary technology. We have a compaction process that is high strength and very effective.

tpo: What would you say are some key advantages of this technology?

Galanty: A number of special features and know-how have gone into this machine. Franklin Miller started out as a grinder manufacturer. Our grinder uses a cutter cartridge technology that makes it strong and resistant to the heavy solids encountered in septage. A lot of maintenance issues are eliminated by the use of a properly designed grinder. At the screening stage, we have an oversized screen that allows plenty of capacity for very thick, high-solids material. Also, our screen has individual, easily replaceable brushes.

tpo: How does the rock removal system function?

Carlson: Very often rocks and bricks are sucked up into the vacuum trucks and have to be separated out, which our system does with the rock trap. Cleaning that trap is a job nobody wants, but it's an extremely important job. The rock removal system has a screw conveyor that cleans out the belly of the trap at intervals the user can program and conveys the rocks to a bin.

tpo: Are there any other options that enhance performance?

Galanty: The machine can come with secondary and tertiary processes. We have an option for grit removal and for a grease skimmer. That makes it a three-stage solids removal system.

tpo: How does this technology handle the financial side of septage receiving?

Galanty: Many plants depend on an honor system. Our system is automated. We record the flow, and we record the identity of the hauler by giving them a card that they swipe. If they have an account but are not in good financial standing, or if they're not recognized, the system will not open. We can also measure and record the pH. That helps keep plants from receiving caustic materials they would rather not have to deal with. Beyond that, we have software that plants can use for invoicing and billing and for administering the hauler accounts.

tpo: How easy is it for haulers to operate the system?

Carlson: The control system comes with a hauler station interface. Haulers see a large human-machine interface where they just follow the directions.

tpo: What system capacities are available?

Galanty: The SPIRALIFT SR30 has a capacity of 400 gpm when handling septage. A 4,000-gallon truck can get in and out in about 10 minutes.

tpo: What is involved in getting the system installed and operating?

Galanty: It doesn't require a great deal of site work. The customer may have to build a pad for it and make sure it's appropriately located relative to the road for the trucks. They need an electrician to wire it up, and they need to pipe the discharge to where it needs to go. tpo

Small Footprint. Big Capacity.

A BALLASTED FLOCCULATION SYSTEM ENABLED THE SANTAN VISTA WATER TREATMENT PLANT TO DOUBLE CAPACITY AT LOW COST

By Jim McMahon

Surface water is a primary drinking water source for the Arizona Town of Gilbert, which has two water treatment facilities.

As the population expanded rapidly in Gilbert and the adjoining city of Chandler, the town needed to double the capacity of its Santan Vista Water Treatment Plant. The key to the expansion was the RapiSand ballasted flocculation system from WesTech Engineering.

This high-rate clarification process, using rapid mixing and multistage flocculation followed by sedimentation, was a major factor in the selection of the plant expansion as 2018 Water Treatment Plant Project of the Year by the AZ Water Association.

DELIVERING WATER

The Town of Gilbert's North Water Treatment Plant can produce up to 45 mgd, serving about 125,000 residents. It receives water from the Salt River Project, which manages several dams and reservoirs on the Salt and Verde rivers and releases water into canals for distribution to municipalities.

The Santan Vista plant until 2018 had a capacity of 24 mgd, serving more than 125,000 residents in Gilbert and Chandler. This plant receives water through a canal system from the Central Arizona Project. That 336-mile system carries Colorado River water from Lake Havasu, through Phoenix, to south of Tucson, and it is integral to the water portfolios of Gilbert and Chandler. Water is brought to the plant through about 14 miles of 48-inch ductile iron pipeline.

Organic carbon and suspended solids must be removed from the Colorado River water. When it enters the Santan Vista plant, it goes through screening to remove debris, followed by ballasted flocculation and clarification, and also ozone treatment to improve filterability and remove taste and odor. Deep-bed monomedia filtration then removes viruses, bacteria and particulates as small as 1 micron. Finally, the water is chlorinated and pumped to consumers.

PLANT EXPANSION

The Santan Vista plant was commissioned in 2009, and since then, Gilbert and Chandler have seen extensive growth. That required the start of a previously planned second phase of construction, which included the building of new facilities within the operating plant.

Mike Alexander, Santan Vista plant operator, uses an Imhoff cone to determine the operating sand concentration in one of the RapiSand treatment trains (WesTech Engineering).

"Our two municipalities worked together for over a decade to plan the joint facility," says Robert Andrews, maintenance and operations field utility supervisor at the plant. "We evaluated process technologies and delivery methods that would best serve the area and meet prevailing and anticipated drinking water regulations."

In 2017, the Santan Vista plant selected Black & Veatch to design the expansion project and Sundt Construction and Sturgeon Electric for construction. "The expansion was designed to double capacity from 24 to 48 mgd," Andrews says. "We opened the competition to equipment suppliers and selected the RapiSand system as the central process in the expansion."

> "The RapiSand system has fulfilled all expectations for high-rate clarification, at a fraction of the cost of the original ballasted flocculation trains."
> **ROBERT ANDREWS**

The expanded plant includes two RapiSand trains, each with 12 mgd capacity. Ballasted flocculation is a high-rate physical-chemical clarification process that involves the fixing of flocs or suspended solids onto microsand ballast, with the aid of a polymer. Due to its numerous particles, the microsand provides a larger contact area for binding, and the coagulated solids form a dense, ballasted floc.

FAST AND THOROUGH

The RapiSand system is a high-rate clarification process that uses rapid mixing and multistage flocculation, followed by extremely fast sedimenta-

tion. Detention time is about 20 minutes from start to finish. The process includes four steps.

In the first tank, raw water is mixed with coagulant. The coagulated water is then mixed with polymer and recycled microsand in each of two flocculation tanks. Total flocculation time is typically eight minutes, a fraction of the time required in a conventional flocculation system.

The clarification process is critical to the design and uses a high-torque segmented rake system and lamella tube settlers. The flocculated water flows into the clarification tank, where the floc settles; clarified water passes up through tube settlers. The ballasted flocs settle up to 35 times faster than in conventional clarification.

Clarified water exits by way of finger launders above the tube settlers. After clarification, settled floc and sand are collected and pumped to a hydrocyclone, where the sand is separated from the solids. The waste solids are sent to a thickener for settling, and the underflow is recycled to the ballasted flocculation clarifier. The separated sand is returned to the first flocculation tank. Each treatment train contains 10 tons of silica microsand.

"What the RapiSand process does is accelerate the settling rate of the particles," says Shawn Sturgeon, applications engineer with WesTech. "One of its upsides comes when there is a need for more flow capacity with limited real estate. Rapid flocculation and settling combine to reduce the space requirement by up to 90%, when compared to conventional clarification."

In terms of both turbidity and TSS, the system's high rate of sedimentation provides excellent performance characteristics, leaving behind a highly clarified effluent. Typical outlet turbidity is less than 2 NTU. Due to its stability, the process can handle large spikes in raw water turbidity.

CONTROLS UPGRADE

As the plant doubled in size, the controls had to be expanded and modernized. The first step of that project included a complete evaluation and upgrade of the existing control panels, including programming, all performed by WesTech.

The high-rate sedimentation process tank allows ballasted flocs to settle up to 35 times faster than in conventional clarification processes.

A double-train ballasted flocculation system doubled treatment capacity for a low cost.

"The controls were upgraded to include redundant programmable controllers, Ethernet communication between all components in the system, remote operation and new programming to handle the additional equipment," Sturgeon says. "This required two phases to create as little process interruption as possible while allowing a smooth transition into the expansion."

Phase one included preinstallation testing of the upgraded controls, communications and additional inputs/outputs at the WesTech assembly and testing facility in Salt Lake City. The company's controls experts then visited the Santan Vista plant to install the upgrades during a scheduled shutdown. The intent was for the existing system to operate exactly as before, eliminating confusion for the operators. When the plant came back online, the upgraded controls worked flawlessly and the original equipment functioned as usual.

Phase two involved upgrading the operations interface and the programming of the RapiSand trains with the upgraded controls while maintaining a similar feel for the plant. The electrical equipment installation met the construction schedule through the combined efforts of the Santan Vista plant staff, Black & Veatch, Sundt Construction, Sturgeon Electric and WesTech.

"WesTech's controls and programming group made all the physical hardware, made sure the controls and connectivity systems could do what they needed to do, and programmed it so the operators would not see a difference between what they had been doing and what they were going to do in the future," Sturgeon says.

SUCCESSFUL OPERATION

Startup work began in February 2018, and final commissioning was completed in May 2018. "The RapiSand system has fulfilled all expectations for high-rate clarification, at a fraction of the cost of the original ballasted flocculation trains," Andrews says. "Within hours of startup, the outlet water quality matched the quality of the two existing ballasted flocculation trains.

"This is a very robust system. Over the first month of treatment and data collection, the system successfully reduced turbidity in all conditions and yielded a low, more consistent turbidity range in the effluent water quality, between 0.3 and 1.4 NTU."

The expansion received the Water Treatment Plant Project of the Year award for its efficiency in doubling the plant's capacity and for on-time completion 20% below the original cost estimate. The award also cited the project team's collaborative working relationship and the careful planning that minimized shutdown time. tpo

Scott Johnston, lead operator, monitors the equipment and process parameters of the RapiSand treatment trains from his computer.

PHOTOS COURTESY OF TNEMEC COMPANY, INC.

Up and Away!

A KANSAS COMMUNITY HONORS ITS *WIZARD OF OZ* CONNECTIONS WITH A NEWLY FINISHED WATER TOWER THAT PORTRAYS THE WIZARD'S BALLOON

By Jeff Smith

"Come, Dorothy!" cried the Wizard. "Hurry up, or the balloon will fly away."

That memorable line, one of many from the venerable story *The Wizard of Oz,* typifies the theme of the elevated water tank in the City of Wamego, Kansas, winner of the Tnemec's 2019 Tank of the Year contest.

Eight bright colors and what appear to be panels sewn together transform the 500,000-gallon tank into the wizard's hot air balloon. The tank also won Tnemec's People's Choice award for getting the most votes cast by the public on the company's website. The People's Choice is considered along with 11 committee-chosen water tanks for the Tank of the Year crown.

"That's the first time a tank has won both awards since we began the contest 14 years ago," says Mark Thomas, vice president of marketing for Tnemec.

CALENDAR WINNERS

In 2019, more than 300 tanks from all over the U.S. and Canada were entered in the contest. Wamego gathered 4,237 votes; Maxville, Ontario, came in second with 4,194 of nearly 20,000 total votes received. Each year, a photograph of the Tank of the Year appears on the January page of Tnemec's calendar. The others appear on the remaining months' pages. Communities represented besides the top two are:

- West Palm Beach, Florida
- Campbell, Missouri
- Columbus, Ohio
- Farmers Branch, Texas
- Camden, Alabama
- Clinton, Mississippi
- Sammamish, Washington
- Apple Valley, California
- Pensacola Beach, Florida
- Punxsutawney, Pennsylvania

The inspiration for Wamego's tank was the city's strong identity with the 1939 film, *The Wizard of Oz,* says Thaniel Monaco, engineer for BG Consultants, who created the graphic design. Wamego is home to a variety of Oz-themed establishments, including the OZ Museum, which has the world's largest public display of Oz artifacts. They include more than 2,000 items from the movie and the original book series by L. Frank Baum.

A yellow brick road meanders through downtown Wamego, leading to a restaurant named Toto's TacOZ and to the Oz Winery. An annual celebration, OZtoberFest, includes an Oz costume contest, a Toto look-alike contest, and an indoor/outdoor OZ Market that includes Auntie Em's Boutique.

Other Oz attractions include Wizard's Beer and Wine Garden, Professor Marvel's Backyard BBQ Cook-Off, and Munchkinland.

Maxville, Ontario

Campbell, Missouri

West Palm Beach, Florida

> "The tower is one of the first things people see when coming into town, and the bowl seems to rise right out of the middle of the highway, like a hot air balloon."
> **BILL DITTO**

COMMUNITY PRIDE

The water tank was originally constructed in 2015 and painted with Tnemec's Series 700 white. City leaders wanted to create a noteworthy design. Longtime city commissioner Bill Ditto says the bright colors and design on the newly finished water tower reflect community pride in its attractions. "The tower is one of the first things people see when coming into town, and the bowl seems to rise right out of the middle of the highway, like a hot air balloon," Ditto says.

The single-pedestal tank's balloon design was painted in 2019 by Classic Protective Coatings of Menomonie, Wisconsin. After pressure washing, a Tnemec fluoropolymer finish coat — Series 700 HydroFlon — was applied with rollers, sprayers and brushes. After extensive planning, the coating took five weeks and was finished in June.

Monaco says the biggest challenge was scaling and transferring the images of the design onto the contours of the tank from two-dimensional templates that were laid on the ground.

"The tank is much like an attractive billboard and helps direct people to this beloved Kansas town and all of its attractions," Ditto says. **tpo**

product spotlight
water

Combatting 'forever' chemicals

By Craig Mandli

The storyline is familiar: A new chemical of concern poses a public health risk. In this case, industries have widely used this chemical for decades, but its negative health impacts are just beginning to be studied. The class of chemicals this time is known as per- and polyfluoroalkyl substances, or PFAS, a family of more than 3,000 manufactured chemicals that were put into production in the 1950s. Now amidst a deeper awareness of the health and environmental impact of these chemicals, **CETCO** has introduced **FLUORO-SORB adsorbent,** a NSF-certified product that treats PFAS.

The adsorbent is designed to efficiently bind the entire spectrum of PFAS, including PFOA, PFOS, PFHxS and PFNA, in a wide variety of removal and remediation processes. Its specially modified surface resists competitive adsorption from other water and sediment contaminants.

"It's a unique product that effectively stabilizes contamination sources and minimizes further migration of the contamination beyond the source area," says Mike Kozak, CETCO's vice president. "It can be effectively integrated into most remediation strategies including in situ stabilization and solidification for source zone treatment."

The media is available in four granule sizes. It can be deployed in flow-through filtration technology for drinking water or groundwater, as a permeable reactive barrier for passive groundwater, for in situ stabilization in source zone treatment, within a CETCO Reactive Core Mat composite geotextile for sediment capping, and in pre- or post-treatment along with other treatment media. The material is NSF/ANSI 61 certified and is manufactured in an ISO9001:2015 facility.

FLUORO-SORB from CETCO

FLUORO-SORB adsorbent can also be combined with traditional technologies as a pre- or post-treatment media, according to Kozak. "As we developed FLUORO-SORB adsorbent, we recognized that widely used adsorbent media perform other essential filtering functions, yet FLUORO-SORB adsorbent could assist with much of the 'heavy lifting' when it comes to PFAS and other contaminant removal," he says. "By doing so, we can help extend the life of other more costly treatment media and provide a more cost-effective treatment solution."

As the U.S. EPA along with many states and communities on the local level are actively considering new regulations, Kozak believes that employing FLUORO-SORB can help utilities get ahead of the curve.

"It offers stakeholders a versatile and cost-effective solution for treatment of PFAS with the ability to scale into a viable source control solution," he says. "That's a much-needed solution for today and tomorrow." **800-527-9948; www.cetco.com**

Flomatic Valves Model Cycle

The Model Cycle Gard IV CB152SST from Flomatic Valves is a stainless steel, direct-acting, constant-pressure pump control valve with tappings. The body is equipped with 1-inch NPT-size female inlet threads and 1-inch NPT union end female outlet connection. The valve's standard pressure range is 15 to 75 psi with an optional 15 to 150 psi range. The valve body maximum pressure rating is 400 psi. All of the valve's internal parts are corrosion resistant with a stainless steel spring and fasteners for long service life. It maintains a preset operating pressure, reduces rapid pump cycling and is proven protection for wells and booster pumps.
800-833-2040; www.flomatic.com

Generac Industrial Power G4.5L engine

Generac Industrial Power's G4.5L naturally aspirated engine has an engine block that offers integrated oil to water cooler for reduced oil temperatures and increased oil life. Five four-bolt main caps provide increased strength and rigidity. A forged crankshaft provides superior strength and durability with precision balance for long bearing life and reduced noise, vibration and harshness. Forged connecting rods with fracture-spilt caps provide strength and reduced cap shift, improving bearing life. High-performance cast aluminum pistons are designed for long engine life. Optimized skirt profile reduces friction and scuffing while chrome-coated piston rings ensure long life and reduce wear. A front-end drive with automatic belt tensioner extends the engine's life and reduces maintenance.
888-436-3722; www.generac.com

IWAKI America Walchem Fluent wastewater software tool

IWAKI America's Walchem Fluent is a cloud-based water treatment management software tool that is available on the W600 and W900 series Walchem analytical controllers. It provides the ability to monitor and control all aspects of processes remotely with your computer or smart device. Users can access current and historic data and also export graphs or files for reporting needs. Programmable alarms with customizable escalation ensure quick identification of critical process issues.
508-429-1440; www.walchem.com

Watts SpecHUB specification tool

SpecHUB from Watts is a one-stop project specification tool that helps engineers, architects and design-build contractors specify with planning. Watts products can be specified and selected according to

product spotlight
wastewater

Solar-powered buoy assists in algae control

By Craig Mandli

Reducing algae growth in wastewater effluent from lagoons is important to maintaining good environmental water quality. The **MPC Buoy** from **LG Sonic** combats the issue by combining online water-quality monitoring, web-based software and ultrasound technology to provide state-of-the-art treatment designed to eliminate up to 90% of the algae and cyanobacteria in lagoons, lakes, dams and water reservoirs.

Wastewater lagoons especially can suffer from severe algal blooms in the warmer seasons. Because of high water temperatures and nutrient levels, algae can reproduce quickly. Biologists at LG Sonic knew that ultrasound is an effective method to control algae. But they learned that the ultrasonic treatment needs to be adjusted according to the type of algae and other parameters in the water in order to perform at its highest efficiency.

The buoy is a floating, solar-powered system that combines real-time water-quality monitoring and ultrasonic sound waves. It helps prevent the growth of new algae while also reducing BOD, TSS and chemical usage. The device exerts control in areas up to 1,600 feet in diameter. Every 10 minutes essential parameters are monitored. The monitored data is then automatically transferred to a web-based software.

"We receive real-time water-quality data to verify the current status of the lakes of our customers," says Lisa Brand, a microbiologist with LG Sonic. "Based on our developed algorithm, we modify the ultrasonic program to the specific algae type that is present in the water."


MPC Buoy from LG Sonic

The buoy provides a complete overview of water quality by collecting data on chlorophyll, blue-green algae, pH, turbidity, dissolved oxygen and temperature every 10 minutes. The collected data is delivered in real time via radio, general packet radio service or 3G to web-based software. The ultrasonic transmitters are activated and optimized based on the received information.

"Once a specific program is set to target the algae, four ultrasonic transmitters will ensure complete coverage of a designated area," Brand says. "Our customers can visually follow the water quality and progress of the ultrasonic treatment."

The ultrasound creates a sound layer in the top sector of the water, keeping algae from rising to the surface to get sunlight. The algae then sinks to the bottom, where it is degraded by bacteria. **833-547-6642; www.lgsonic.com**

building requirements and codes. SpecHUB can save time when researching products with instant access to product information, and it can create written specs, plumbing schedules, building information modeling files, submittals and more.
978-688-1811; www.watts.com

Fluoramics Bust That Rust penetrating oil

Bust That Rust from Fluoramics is engineered to provide rust-breaking capabilities. Its foaming action allows the penetrant to soak deep into and beyond the areas to which it is applied. Solvent free, it will not evaporate, and it lubricates while breaking through existing rust. Bust That Rust will also help prevent new rust from forming. It comes in an 11.5-ounce aerosol can for ease of application, along with an attached straw for smaller or hard-to-reach areas. Bust That Rust is suited for use on nuts/bolts, padlocks, shafts, flanges, hinges and all other rusted metal parts.
507-205-9216; www.fluoramics.com

Thermo Fisher Scientific OdaLog gas data loggers

OdaLog gas data loggers from Thermo Fisher Scientific, distributed in the U.S. by CAS DataLoggers, are used to record the level of hydrogen sulfide emissions and other gas emissions in pumping stations, manholes and sewer lines. Originally established in Australia in 2009, the OdaLog was designed in conjunction with wastewater authorities to survive the hot and humid conditions found in those areas while recording parts per million gas levels. It comes in three models: the Type 2L-SL with a standard sensor, the Type L2-LL with a long-life sensor and the Type RTx with a cellular modem. Bluetooth is available on all of the loggers, and they are supported by OdaStat software for device configuration.
800-956-4437; www.casdataloggers.com

Endress+Hauser Netilion Industrial Internet of Things platform

Endress+Hauser's Industrial Internet of Things solution platform, Netilion, is an ecosystem combining digital services and system components to improve the life cycle and asset management, maintenance and support of instruments, and analyzers. Netilion keeps track of installed base, documentation and data management, and instruments' performance and health status. Netilion's digital services available today are scanner, analytics, health, library and value. These digital services can be used separately or in concert to improve the management, maintenance and support of instrumentation systems, regardless of instrument or analyzer type or vendor.
888-363-7377; www.us.endress.com tpo

worth noting

people/awards

Bartow County, Georgia, earned a WaterFirst designation. The program is a voluntary partnership between local governments, state agencies and other organizations that want to work together to improve quality of life through wise management and protection of water resources.

The **Princeton Wastewater Treatment Plant** was named Wastewater Plant of the Year by the Illinois Rural Water Association.

Wayne Graham of the Vermont Rural Water Association received a 2019 Regional Wastewater Trainer of the Year Excellence Award from the U.S. EPA.

Paul Desrosiers, an operator of the Narragansett Bay Commission facilities at Field's Point and Bucklin Point in Rhode Island, received a 2019 U.S. EPA's New England office 2019 Regional Wastewater Treatment Plant Operator of the Year Excellence award.

The **Hollister Water Reclamation Facility** was named Best Small Plant for 2019 by the California Water Environment Association.

The **Thomasville Water Treatment Plant** received a Georgia Association of Water Professionals Platinum Award for operating with perfection during 2019.

Bob Kloke, water production supervisor for the Columbus Water Department in Nebraska, retired after 38 years of service. tpo

events

July 7-9
New Jersey Section of the American Water Works Association Annual Conference, The Borgata Hotel Casino and Spa, Atlantic City, New Jersey. Visit www.njawwa.org.

July 7-9
New York Section AWWA Annual Conference, Saratoga Springs City Center, Saratoga Springs, New York. Visit www.nysawwa.org.

July 12-15
Georgia Section AWWA Annual Conference, Savannah, Georgia. Visit www.gawwa.org.

July 13-16
Texas Section AWWA Annual Conference, Fort Worth Convention Center, Fort Worth, Texas. Visit www.txwater.org.

July 19-22
Kentucky-Tennessee Section AWWA Annual Conference, Chattanooga Convention Center, Chattanooga, Tennessee. Visit www.kytnwpc.org.

July 21-23
Arizona Section AWWA Annual Conference, Phoenix Convention Center, Phoenix. Visit www.azwater.org.

July 27-29
Ontario's Water Conference & Trade Show 2020, Scotiabank Convention Centre, Niagara Falls, Ontario. Visit www.owwa.ca.

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