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SUSTAINABLE OPERATIONS:
Clearing up a river | 20

IN MY WORDS:
Young minds
at work | 28

TECH TALK:
Working with OEMs
on upgrades | 30

A Lot on Her Plate

**JENNY MOSS DIRECTS OPERATIONS
AT ONE DRINKING WATER AND
THREE WASTEWATER TREATMENT PLANTS**

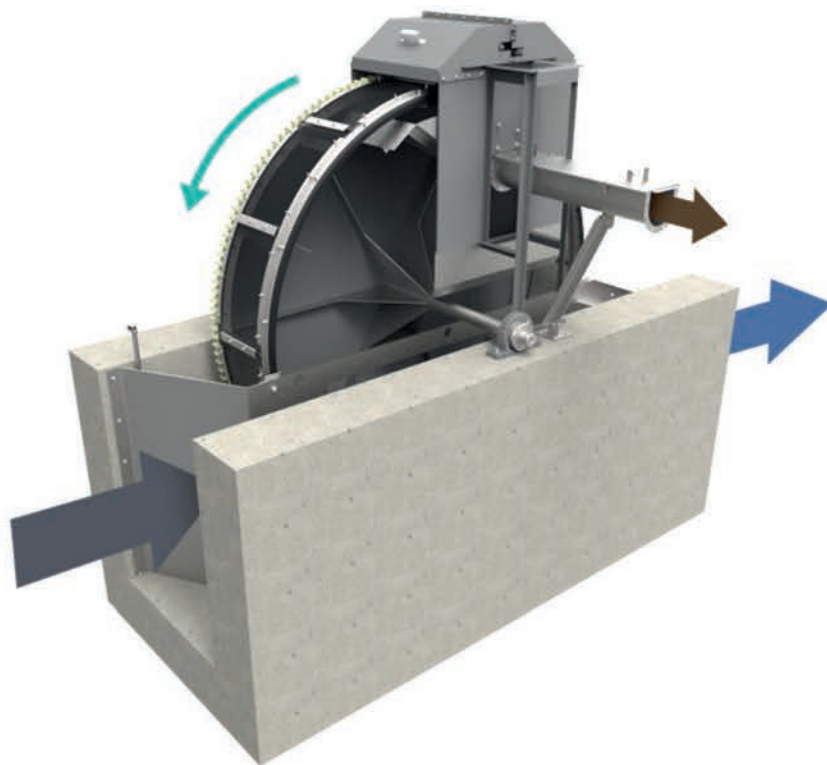
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Jenny Moss
Director of Water and Wastewater
Hopkinsville, Ky.



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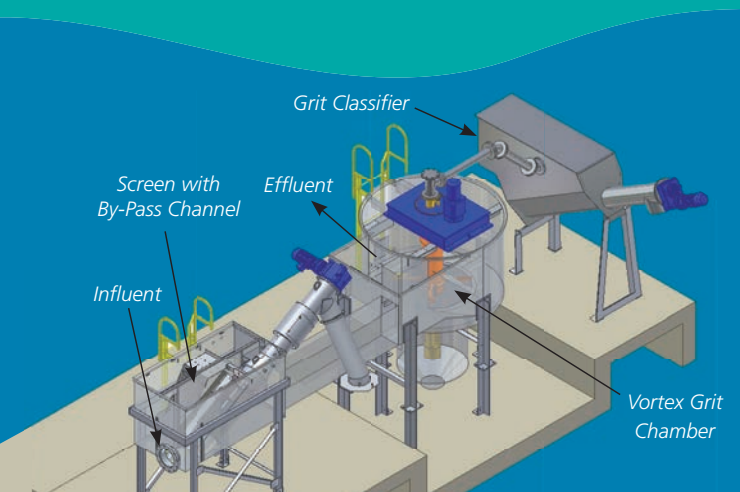
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advertiser index

August 2022

	AIIMax Software, Inc.	57		Kuhn North America, Inc.	51
Anue Water Technologies	9		Lakeside Equipment Corporation	3
	BDP Industries, Inc.	11	Landia, Inc.	19	
	BioSafe Systems	57	Ovivo USA, LLC	2	
Bright Technologies, Division of Sebright Products, Inc.	.....	51	Park Process	60
Charter Machine Company	.....	35	Parkson Corporation	37
Crane Pumps & Systems	.....	5	Paxxo	8
Duperon Corporation	.....	15	Penn Valley Pump Co., Inc.	29
E&I Corporation	.....	61	Prime Solution, Inc.	53
	Eagle Microsystems, Inc.	59	Pulsed Hydraulics, Inc.	60	
ELODE USA, Inc.	31		Roto-Mix, LLC	61
FKC Co., Ltd.	55		Saf-T-Flo Chemical Injection	47
Fournier Industries	9		SAVECO / Enviro-Care	39
	Gorman-Rupp Company	17		ScreenCO Systems LLC	60
	HF scientific, a Watts Brand	25		Smith & Loveless, Inc.	27
Hurst Boiler	.....	63	USP Technologies	21
	JDV Equipment Corporation	21		Vaughan Company, Inc. ...	back cover
	JWC Environmental Inc.	7	CLASSIFIEDS	60	
	Komline-Sanderson	4			

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contents **August 2022**

- 8 **LET'S BE CLEAR: THE PUBLIC SECTOR MOVES SLOWLY. WHY EXACTLY?**
Realities of the government world are part of the reason. But maybe much of the difference from the private sector comes down to culture and attitudes.
By Ted J. Rulseh, Editor

- 10 **@TPOMAG.COM**
Visit daily for exclusive news, features and blogs.

- 18 **HOW WE DO IT: OFF WITH THE AIR**
A switch from aerobic to anaerobic digestion means more energy production and lower costs for a water reclamation facility in West Palm Beach, Florida.
By Mary Shafer

- 20 **SUSTAINABLE OPERATIONS: CLEARING UP A STREAM**
A residuals management facility in a Canadian city eliminates an unsightly plume of water treatment solids from a popular recreational river.
By Ted J. Rulseh

- 28 **IN MY WORDS: YOUNG MINDS AT WORK**
A Global Innovation Challenge lets students worldwide compete for cash prizes as they devise potential solutions to the world's pressing water problems.
By Ted J. Rulseh

- 30 **TECH TALK: HELP ON THE WAY**
Do-it-yourself projects can be great, but original equipment manufacturers often add value when upgrading and optimizing treatment plant equipment.
By Doug Pimlott

- 38 **HEARTS AND MINDS: POSTER CONTEST COMES FULL CIRCLE**
The Carmichael Water District creates a water-wise poster contest to engage middle school students on water conservation.
By Sandra Buettner

40 **HEADWORKS AND BIOSOLIDS MANAGEMENT DIRECTORY**

- 46 **TECHNOLOGY DEEP DIVE: UNIFIED MONITORING FOR WATER NETWORKS**
A cloud-based monitoring solution offers comprehensive automation and supports optimization for critical parameters, from anywhere at any time.
By Ted J. Rulseh

- 48 **PRODUCT FOCUS: HEADWORKS AND BIOSOLIDS MANAGEMENT**
By Craig Mandli

top performers



- 12 **WATER OPERATOR: A LOVE OF LEARNING**
By focusing on self-improvement, Danny Locco made himself a valuable and versatile leader and an effective mentor to members of his teams.
By Suzan Chin-Taylor

- 22 **WATER/WASTEWATER OPERATOR: A LOT ON HER PLATE**
Jenny Moss directs operations at one drinking water and three wastewater treatment plants. She credits her teams for her success and industry recognition.
By David Steinkraus
- ON THE COVER:** After college Jenny Moss wanted a job involving nature and animals. Low pay for natural resources jobs quickly ended that notion, and she found herself with a career in water and wastewater. She is now director of water and wastewater in at the Hopkinsville (Kentucky) Water Environment Authority. (Photography by Martin Cherry)

- 32 **WASTEWATER OPERATOR: FROM CHAOS COMES ORDER**
Justin Myers walked into a new job at a plant in the middle of a major upgrade. With his team, he saw it to completion and a record of exemplary performance.
By Ted J. Rulseh

- 52 **CASE STUDIES: HEADWORKS AND BIOSOLIDS MANAGEMENT**
By Craig Mandli

- 54 **PRODUCT NEWS**
Product Spotlights:
Wastewater: System takes grit removal to miniscule levels
Water: Prepackaged video system a fit for remote site management
By Craig Mandli

- 59 **INDUSTRY NEWS**

- 61 **EXAM STUDY GUIDE**
By Rick Lallish and Drew Hoelscher

- 62 **WORTH NOTING**
People/Awards; Events

coming next month: September 2022 **FOCUS: WEFTEC Pre-Show Issue/Digital Technology**

» Let's Be Clear: Playing Offense on Biosolids » TOP PERFORMERS: Water Plant: Plum Creek WPF, Castle Rock, Colorado | Wastewater Operator: Jamie Belden, Wichita, Kansas | Wastewater Biosolids: Biogas to vehicle fuel project, Longmont, Colorado » How We Do It: Efficient dewatering in Montague, Massachusetts » In My Words: Recognizing nitrogen and phosphorus reductions » Sustainable Operations: Indirect potable reuse in Bartlesville, Oklahoma » Hearts and Minds: Keeping "Rivers Alive" in Clayton County, Georgia » Technology Deep Dive: Automated chemical treatment for phosphorus

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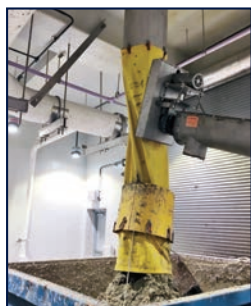
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AFTER



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let's be clear

The Public Sector Moves Slowly. Why Exactly?

REALITIES OF THE GOVERNMENT WORLD
ARE PART OF THE REASON. BUT MAYBE MUCH
OF THE DIFFERENCE FROM THE PRIVATE SECTOR
COMES DOWN TO CULTURE AND ATTITUDES.

By Ted J. Rulseh, Editor



We've all heard the lament: In the public sector it's hard to get things done. There's too much red tape. Too many procedures. Every decision takes multiple reviews.

But why is that? Does it have to be that way? Moving from some private-sector businesses to a public agency can bring on culture shock. I experienced that when I transitioned from an advertising agency to a regulated electric utility, an industry that shares the public sector's reputation for being stodgy and bureaucratic.

There are some logical reasons why in the public sector the wheels grind slowly. Entities like cities, counties and water utilities are in the public eye. By law, they have to be accountable. Public funds have to be watched carefully, expended judiciously. People can get crucified in the media for making honest mistakes. It's no wonder they're cautious and move slowly.

A QUESTION OF CULTURE?

But in my experience, at least a fair share of the difference between the private and public sectors comes down to basic culture, to attitudes toward work, whether on behalf of paying customers or internal customers — which is to say, co-workers.

In the advertising world, when hiring, we looked for people with what we called “agency genes.” That meant people who innately understood that we were in a service business — that clients' desires were our commands.

We used expressions like, “The difficult we can do immediately; the impossible takes a little longer.” We looked at high-profile, short-turnaround projects as chances to amaze the client by “riding the motorcycle through the flaming hoop.”

I recall one occasion when an art director lamented a harsh client-imposed deadline on a project: “That's going to be a problem.” His boss replied, “It's not a problem. It's a fact.”

NEVER SAY “NO”

Given that mentality, we went above and beyond on our teams to help each other. When someone came with a request, the word “no” was unacceptable. The operative word was “how?” The job had to get done. If that meant staying late, or stepping on the figurative gas pedal, or calling in outside help, then so be it.

Before I joined the ad agency, I had been a newspaper reporter and editor, and there the culture and basic assumptions were similar. Then after a combined 17 years in those environments I joined the power company as a public affairs representative.

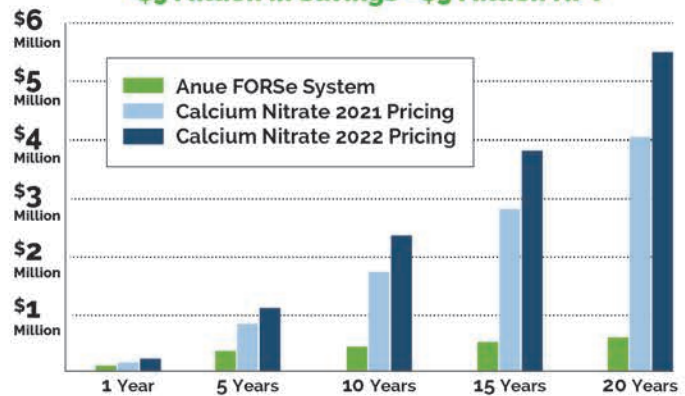
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I recall the first time I asked someone from another department for assistance. An alderman had asked me for information to share with his constituents about heating assistance in winter. I called consumer affairs and asked a staffer if he could pull some materials together.

He replied, "I'm kind of busy. I'll get to it when I can."

And I was stunned. I wanted to say, "Sorry. Wrong answer!" I should have gone down to his department and gathered the materials myself. Instead I waited. Two weeks later the items hit my inbox. A similar request at the ad agency would have been fulfilled within the hour.

BREAKING HABITS

Of course not every request I ever made to a colleague was treated so cavalierly. I wasn't the only person in the company with a service mentality, with "agency genes." But on the whole the difference in responsiveness between the utility and the ad agency was striking.

In a way it was also understandable. After all, the utility was a monopoly. No competitor was sitting by, watching, waiting for a stumble and a chance to steal a client. Why should there be any sense of urgency? In the agency world the threat of competition, the consequence of failure, was always top-of-mind.

So is it possible for a public agency to change to a passionately attentive service culture? Within the necessary strictures I mentioned early on, I believe it is. It would take a leader able to convey the intrinsic satisfaction that goes with prompt and truly excellent service.

From my ad agency years, I can tell you there's intense pride in doing the near-impossible on a ridiculous timeline. Or to say it differently, it feels great, every now and then, to ride that motorcycle through the flaming hoop, or at least to know that you can if you need to. **tpo**

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WWTP TOURS

Show Operators New Processes

Pre-project planning recently helped the Macon Water Authority in Georgia find the right rotary press for its wastewater treatment plant rehabilitation. While operators were initially hesitant about the change to a new process, field trips to other treatment plants quickly alleviated their concerns.

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GREEN STORMWATER INFRASTRUCTURE

Helping Rain Stay Put

Thorsten Knappenberger, a professor at Auburn University, recently conducted a study on how to make green stormwater structures better. The study focused on two ways to try and improve bioretention cells. One was to ensure water soaks into the soil at an optimum rate to treat pollutants, and the other was to increase how many pollutants the cell can trap.

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OVERHEARD ONLINE

"EPA's decision to reduce these health advisory levels from 70 ppt to as low as 0.004 ppt will have a significant impact on water utilities, who receive these chemicals from industry and consumers and are not generators themselves."

New EPA PFAS Advisories: What Now?
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WATER QUALITY AWARD

Louisville Water Recognized

Louisville Water Company recently received the highest award possible from the American Water Works Association's Partnership for Safe Water — the Phase IV Distribution Presidents Award. The company is one of only five water utilities in the country to achieve this status.

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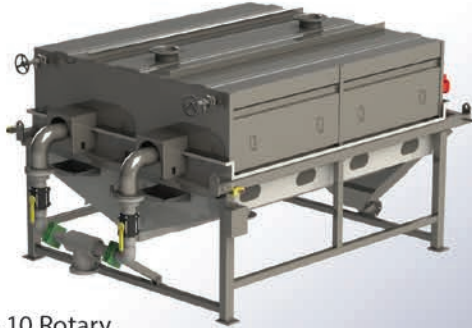


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BY FOCUSING ON SELF-IMPROVEMENT, DANNY LOCCO MADE HIMSELF A VALUABLE AND VERSATILE LEADER AND AN EFFECTIVE MENTOR TO MEMBERS OF HIS TEAMS

STORY: **Suzan Chin-Taylor** | PHOTOGRAPHY: **Ron Scheffler**



Danny Locco inside the Woodward Avenue Wastewater Treatment Facility pump station, with a bank of six high-lift Goulds pumps, Model 3498, with 24,000 gpm capacity, each powered by a 1,900 hp TECO-Westinghouse 4,160 V motor.

“I didn’t want to be stagnant. It was important that I continue to improve myself and challenge myself to do better, not just in work but in life.”

DANNY LOCCO

Danny Locco is a man of many talents. His diverse training, education and varied positions in the water treatment industry make him valuable — a manager who can go wherever he is needed and excel.

After college he did not envision himself in a water career. But after applying for work in June 1990 at the Municipality of Metropolitan Toronto water treatment plant, he soon knew he had found his life path.

Fast forward three decades and Locco enjoys a fulfilling career in which he makes a positive impact on his community every day. As superintendent for water distribution in Hamilton, Ontario, he also helps operate distribution systems. He’s in a unique position to lead his utility through important initiatives like lead service line replacement.

A WINDING ROAD

Locco’s first position in the water industry was as a water treatment operator for Metropolitan Toronto. After three years he took a position with the Regional Municipality of Niagara, which was closer to his childhood roots in the region; he stayed for 21 years. He then moved to Hamilton and assumed his current position.

Although he has changed jobs and locations, Locco has never wavered in his love for the job and the choice he had made to enter the industry. “When I first walked into the water plant in Toronto, I knew this was the job I wanted to do,” Locco says.

“I liked that I would be providing a valuable service, one that often people take for granted. With so many people in the world who don’t have access to fresh, clean or safe drinking water, it feels good to contribute to my community. The work is always interesting, and I find it very fulfilling.”

For most of his career, Locco was a treatment plant operator. While in Toronto he worked as an operator at several water plants, including RC Harris, Decew Falls, Grimsby and Toronto Island. In Hamilton he has stepped up to the role of acting plant maintenance and technical services manager. In 2020 he filled in as acting plant operations manager for several months. These are just a few of numerous times he has been asked to fill a vacant critical management position.



Danny Locco,
Hamilton, Ontario

POSITION:
Superintendent Water Distribution and Overall Responsible Operator Distribution

DUTIES:
Distribution, investigation and technical support

EDUCATION:
Chemical engineering technician Mohawk College; maintenance management professional, Northern Lakes

College; graduate, California State University water treatment and water distribution certification program

CERTIFICATIONS:
Water Treatment III, Water Distribution IV

GOALS:
Be of service to the community; help colleagues be their best personally and professionally

He has been chosen for his diverse skills and multiple certifications. He regularly attends director-approved trainings as well as nontechnical courses for leadership and team development and is a Six Sigma Green Belt.

He outs these skills to work constantly for Hamilton’s large and diverse operations. Hamilton takes water from Lake Ontario and treats it at its central Woodward Avenue Water Treatment Facility. Raw goes through pre-chlorination, screening and clarification by coagulation with polyaluminum chloride. This is followed by flocculation via mechanical mixing and sedimentation.



Locco in the Ferguson Pumping Station. The Goulds Vertical Industrial Can-Type pumps have US Motors (Nidec) motors; valves are Cla-Val.



Locco is pictured at a bank of evaporators. A Wallace and Tiernan Series 50-200 evaporator (Evoqua Water Technologies) on the right side converts liquid chlorine to gas, which is sent to a bank of Wallace & Tiernan chlorinators and mixed with treated water.

Granulated activated carbon is then used to remove taste and odor. Chlorine and ammonia are added to bring the chlorine residual to 2.2 to 2.5 mg/L. Fluoride is also added. The plant has a capacity of 2 mgd and at present operates one-fourth to one-third of its capacity.

Four areas in Hamilton use groundwater as their drinking water; treatment is handled by the Carlise, Freelon, Greenville and Lynden facilities, which use a variety of treatment processes. The city owns, operates and main-

tains the central and communal well water distribution systems, which include 1,260 miles of water mains, 12,755 fire hydrants, 20,860 water valves and 144,683 service connections.

A HELPING HAND

Mentorship has always been important to Locco. “You can learn something from everybody, even if it’s not what to do,” he says. He has been mentored by various superintendents who advised putting himself on a path of self-improvement. “Some people would talk about continuous improvement, and at the time it may have felt like a catchphrase,” he says. “But I didn’t want to be stagnant. It was important that I continue to improve myself and challenge myself to do better, not just in work but in life,” says Locco.

One particular during his time at Niagara, Andy Forbes, taught him the value of hard work and a continuous improvement mindset. Because of that, Locco is always on the lookout for industry articles, webinars, conferences and outlets

where he can take in as much training as his schedule allows and so expand his industry knowledge and keep up with trends.

Locco isn’t afraid to ask questions. When something happens in the field that he has not witnessed, he will go out to observe it. As a leader, he practices management by walking around, not to micromanage his team but to talk to the staff, get their input and understand what is happening with the system. He believes that being too disconnected from the front lines can put a leader at a disadvantage.

“The water industry tends to be a trial by fire,” he says. “You can learn a lot from textbooks and conference sessions, but you learn the most from just plain experience, being out there in the field and seeing what’s going on.”

Locco encourages team members like water supervisors Peter Nikolica, Tony Johnson and Andrew Dixon, project manager Janice Takahashi and technologist/inspectors Paul Horton and Joe Klander to seek out training. He also brainstorms with them on how to resolve issues, make the system more efficient and improve water quality.

Hamilton offers a strong training program that enables operators to take leadership training courses on subjects such as communication and management. The city also supports staff members who want to pursue out-

side educational opportunities. The leadership looks to engage the staff in as many projects as possible, fostering innovation and strengthening the workplace culture.

TACKLING CHALLENGES

Like most cities, Hamilton and its metropolitan area face the issues that come with an aging water infrastructure. With that in mind Locco and his

(continued)



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team have been developing a Pressure District Narrative.

One unique challenge is the Niagara Escarpment, which runs from Canada into Pennsylvania. The large elevation difference that the locals refer to as “the mountain” affects distribution system performance. The Pressure District Narrative will serve as a reference manual for all Hamilton Water staff to refer to: plant and distribution operators, project managers and system planners alike.

The manual will help staff operate the complex water system and deal with the unique complexities of 25 pressure districts. The manual is designed as a resource to support quick and sound decision-making and strategic planning. It also and to provide basic information to help team members respond to public, media and intermunicipal inquiries.

In 2021, the Ontario Water Works Association recognized Locco with its Operator Meritorious Award. “I believe I’ve successfully led projects and led teams, and a lot of my staff



The Hamilton Water team includes, from left, Richard Fee, water treatment plant supervisor; Peter Nikolica, superintendent, water distribution; Locco; Paul Horton, water distribution technologist; and Jason Fox, superintendent, water treatment process. The group is pictured in front of the Generator Building at the City of Hamilton's Woodward Avenue facility.

“You can learn a lot from the textbooks and conference sessions, but you learn the most from just plain experience, being out there in the field and seeing what’s going on.”

DANNY LOCCO

members who worked for me have gone on to higher and better positions,” says Locco. “That is the one thing I’m most proud of. It feels good that I had the opportunity to help them grow and learn, to be a coach and mentor to them and to encourage them to take new opportunities, even if it meant I was going to lose them.”

Locco considers working in the water industry to be a rewarding career path, although serving the community comes significant responsibility. When called to shift gears and go where he is needed, he always accepts: Although his title is superintendent of water distribution, he ultimately he works for Hamilton Water and is there to do what’s best for the utility.

His advice to his peers seeking success and enjoyment of their time in the industry: “Be a diligent worker and a straight shooter. Accept that you’re going to ride the difficulties but that there are opportunities everywhere. Don’t be afraid to ask questions if you don’t know. In these ways you will always be self-improving on a professional and personal level. That will take you very, very far.” **tpo**

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GETTING THE LEAD OUT

Two major concerns for the water distribution team at Hamilton Water are lead service lines and water age.

When the distribution technologists and support teams are called to a home to investigate water quality or poor pressure, they sometimes discover lead piping. The city offers loans to help the owners to replace the line segment they are responsible for, while the city replaces its segment.

The effects of lead lines not replaced are mitigated by a corrosion control program that involves injection of orthophosphate at the plant. Carried through the distribution system, it coats the internal pipe walls and keeps lead from leaching out.

To address water age, Danny Locco worked with the Jacobs consulting firm, to develop a corrosion control, nitrification and water age study. The purpose was to review the distribution system water quality and operating data before and after implementation of corrosion control.

The study aims to identify potential secondary distribution system impacts, including nitrification. Water age is a key focus, as it may contribute to conditions that favor nitrification.

A second project will update the city’s existing monitoring program with a focus on nitrification monitoring and response, and improved monitoring for other secondary impacts that the distribution system assessment may identify.

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Off With the Air

A SWITCH FROM AEROBIC TO ANAEROBIC DIGESTION MEANS MORE ENERGY PRODUCTION AND LOWER COSTS FOR A WATER RECLAMATION FACILITY IN WEST PALM BEACH, FLORIDA

By Mary Shafer

A major upgrade to the solids process at a Florida clean-water plant has improved efficiency, reduced costs and enabled production of energy. The \$100 million project at the East Central Region Water Reclamation Facility in West Palm Beach, Florida, featured conversion from aerobic to anaerobic digestion of biosolids. The upgrade also included a FOG receiving station, centrifuge dewatering and odor control for the biosolids process.

The regional plant is shared by West Palm Beach, Palm Beach County, the cities of Lake Worth Beach and Riviera Beach, and the town of Palm Beach. Clifford Sanders, executive manager of water reclamation at the plant, shepherded the upgrade which began in October 2015 and is now essentially complete.

LOGISTICAL CHALLENGES

Before the upgrade, the plant's solids process faced challenges. The infrastructure, including the belt filter presses and the aerobic digester, was aging. Feeding oxygen to the aerobic digestion process was becoming costly.

"When they decided to upgrade some things in the plant, they felt that anaerobic digestion might be a good way to save on energy costs," says Sanders. Initially, the plant had three decanting tanks — three 1 million-gallon storage units and the 10 million-gallon aerobic digester — for a total of 13 million gallons of storage capacity. One tank was repurposed for wasting, another for centrate, and the third is planned for abandonment.

The plant upgrade included the addition of a new aeration basin with anoxic and aerated zones. The aerobic digester was converted to the new aeration basin, and two of the decanting tanks were converted to a centrate tank and a waste tank. "We had only a million gallons total storage capacity during this time period, and we waste between 0.8 million and 1.2 million gallons per day," Sanders says.

That left no room for error on the back side, removing the waste. To help mitigate permit exceedances, the plant team brought in Synagro, which provided mobile centrifuges to process sludge that was sent to NEFCO, a contractor for the Palm Beach County Solid Waste Authority.

The contractor had to process a million gallons a day just to allow Sanders to run his operation without backups. "We couldn't have any breakdowns or stoppages," he says. "Of course, during the whole construction phase, we did have those issues. But that just illustrates how tight it had to be."

DEWATERING IMPROVEMENTS

This stress on the system revealed the inefficiency of the dewatering operation. The old gravity belt thickeners had been taken out of operation 20 years earlier.



An operator at the East Central Region Water Reclamation Facility performs maintenance on the Alfa Laval gravity belt thickener.



Unison Gas Compressors used to supply biogas to boilers.

"In the past four or five years, there has been a push for efficiency in showers and toilets in homes, how much water they use," Sanders says. "As a result, solids have increased in the flow to the plant. We take in about 45 mgd. The flow has remained relatively flat, but the solids in that flow have increased by 20% over the years."

Data showed that, even on a good day, the plant wasting process was removing only about 1% of the solids. The old aerobic digester was achieving only 10-11% volatile solids destruction in a stream with about 60% volatile solids. The East Central Region plant staff had to find a way to remove far more solids from the waste stream, to relieve pressure on the downsized storage capacity and decrease the energy required for solids processing.

The team decided to rehabilitate and reactivate the gravity thickeners to increase the percent solids ahead of the digesters. That move has increased total solids removal to 5%, helping the digesters to achieve 60% volatile acid destruction.

DOUBLING DOWN

Another efficiency increase came from replacing the dewatering belt presses with decanter centrifuges (Andritz) to dewater the material entering from the six digesters. The Hazen and Sawyer engineering firm designed a thermophilic/mesophilic digestion process in which digesters operate at temperatures between 92 to 98 degrees F (mesophilic) and 131 to 140 degrees F (thermophilic). Thermophilic digestion yields greater biogas production, pathogen destruction and substrate degradation.

However, during the final stages of construction and the six- to seven-month ramp-up to full operating efficiency, the digesters operated in the mesophilic mode (95 to 99 degrees F), a range that is easier range to maintain, requires less energy and is more stable. Although the thermophilic sys-

tem will need more energy for heating, Sanders expected to see meaningful cost savings once the digester reached peak performance.

Another addition to the plant was a dedicated collection tank where pumpers offload fats, oil and grease. This helps keep FOG out of the main waste stream while providing a much-needed service for area contractors, who generally dump 6,000 gallons at a time, totaling 150,000 gpd.

The removal of FOG from the main wastewater treatment process helps keep buildups and blockages out of the system while increasing biogas production. The FOG is heated and transferred to the anaerobic digesters, which are maintained at their respective temperatures through three biogas-fueled boilers (Preferred Utilities).

The boilers are fueled by Unison Solutions gas compressors, which dry and compress biogas from the anaerobic digesters. Removing the water from the biogas before usage helps prevent the formation of acids in the boilers. The boilers can be operated on diesel or the produced biogas, the latter being preferred.

FUTURE OPPORTUNITY

Biogas supplements the diesel fuel that feeds the digester-heating boilers; it offers a potential fuel for future cogeneration, although for the time being the excess is flared. As of last spring, engineers were currently considering options using biogas once the biosolids facility is completely online.

"There is the potential of selling the biogas to the Solid Waste Authority because that's where the landfill is, and there is a need for a sustainable amount of gas," Sanders says. "They are only about a mile and a half from us."

"I can see that cogeneration may be in the future of the plant. We're looking at different ways of saving energy because that's a strong initiative from the city." He expects to have projections on efficiency, energy production and cost savings by next year. Meanwhile, the Solid Waste Authority pelletizes dewatered biosolids for sell to commercial fertilizer blenders.

Sanders concludes, "I owe all the successes of the plant during this upgrade to the dynamic, diligent team that works with me. Our operators, mechanics and electricians truly make magic happen here." **tpo**



Andritz centrifuge in biosolids dewatering building.



Lakeside Screening equipment located in the new septicage facility.

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Clearing Up a Stream

A RESIDUALS MANAGEMENT FACILITY IN A CANADIAN CITY ELIMINATES AN UNSIGHTLY PLUME OF WATER TREATMENT SOLIDS FROM A POPULAR RECREATIONAL RIVER

By Ted J. Rulseh

A new residuals management process at a water treatment plant in Alberta is designed to improve the environment for fish and for recreational boaters on the Red Deer River.

The city of Red Deer operates a surface water treatment plant (40 mgd design, 12 mgd average) for 101,000 city residents and several neighboring communities. It draws water from the river and uses the Actiflo rapid-settling clarification system (Veolia Water Technologies).

For years the clarifier blowdown, consisting mainly of solids removed from the raw water along with some aluminum sulfate and sand from the clarification process, was discharged to the river through a stormwater outfall. There was nothing unsafe about the residuals, but the discharge created a visible plume in the river.

In spring 2022 Red Deer began operating a process that thickens and dewateres the residuals, which are then landfilled. The water going back into the river is now much cleaner than the raw water that was taken out.

The new Residuals Management Facility that houses the process won a 2021 Envision Bronze Award from the Institute for Sustainable Infrastructure because it was designed and built with numerous energy-saving and sustainability-enhancing features.

“Regulators asked us to look at options to improve the quality of this waste stream,” says Kingsford Amoah, a city environmental planning engineer and the project manager. “It was not required, but it’s the right thing to do.

“With the high solids content, the discharge had an impact on fish habitat, and the plume made people not want to go boating on that side of the river. It was also a proactive step, because it is only a matter of time before treatment of residuals becomes a regulatory requirement.”

OLD PLANT RAZED

The RMF was built on the site of the city’s first water treatment plant, which was replaced in 1983 by a new plant next door. The old plant and a sludge dewatering facility were demolished to make room for the RMF.

The new facility houses storage tanks for the thickened clarifier blowdown and supernatant, a polymer system (Veolia), a thickener system (Ecodyne), centrifuges (Andritz) and a bin-handling system (Schwing Bioset) for transporting the solids to the landfill. The dewatered residuals are not considered suitable for land application. The clarifier blowdown is stored in the water treatment plant before being moved to the RMF.

The design capacity of the RMF is 1.6 mgd; the average flow is about half that. Amoah expects the facility’s impact to be the most obvious in spring, when snowmelt makes the river water especially turbid. “Snowmelt brings in a lot of organics,” says Amoah. “The quality of the raw water is poor.” Big storms also increase the raw water turbidity and increase the volume of residuals from the clarification process.

The energy-saving features in RMF include a heat exchanger for the HVAC system that uses exhaust air to preheat air being drawn in for ven-



The Residuals Management Facility was built on the site of an old water treatment plant and a sludge dewatering facility on the bank of the Red Deer River, source of the city’s raw water.



The new Residuals Management Facility in Red Deer, Alberta, won an Envision Bronze Award from the Institute for Sustainable Infrastructure.

tilation. Others include enhanced insulation in the roof, use of window light where possible and motion sensors for lighting control. Software for monitoring RMF operations connects with the SCADA system and helps monitor energy use. The building uses about 24% less electricity than similar facilities.

NOISE CONTROL

Another design factor in the Envision award was mitigation of noise and vibration, a high priority because the RMF is within a few hundred yards of various light industrial, commercial and multifamily residential developments. Studies of a similar facility indicated that noise from the RMF might exceed recommended levels for those neighbors.

To reduce noise, power levels in the HVAC system were adjusted and acoustic liners were used in the ductwork. In the centrifuge room, the concrete floor was separated from the outer walls to reduce noise and vibrations. Groundwater management was another factor in the award: monitoring wells were included because some contaminated soil was found on the site.

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“Regulators asked us to look at options to improve the quality of this waste stream. It was not required, but it’s the right thing to do.”

KINGSFORD AMOAH

The outfall for the treated clarifier blowdown is a pipe nearly 100 yards long that discharges the water at midstream. Since the water has been cleaned, it would be acceptable to discharge on the surface or on the riverbank as before, but Amoah says the new outfall allows better mixing and dispersion. The treated water can run continuously through the outfall, or can be stored in tanks for use as construction water or for irrigation of parks.

GOOD DECISION-MAKING

The water treatment plant uses a multistage process that includes clarification, filtration, chlorine and UV disinfection, fluoridation, pH stabilization and chloramination. Other residuals from the plant, such as filter backwash, are discharged to the sewer system.

Construction of the RMF began in 2019 and was completed earlier this year. In announcing the Envision Bronze award Melissa Peneycad, managing director of the Institute for Sustainable Infrastructure, praised Red Deer for using the Envision guidelines both for planning and construction and long-term operations and maintenance decisions.

In particular, the designers followed the city’s policy of encouraging staff to consider the environmental impacts of infrastructure and to develop environmentally sound operating procedures. They also required bidders to observe sustainability principles. **tpo**



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A Lot on Her Plate

JENNY MOSS DIRECTS OPERATIONS AT ONE DRINKING WATER AND THREE WASTEWATER TREATMENT PLANTS. SHE CREDITS HER TEAMS FOR HER SUCCESS AND INDUSTRY RECOGNITION.

STORY: **David Steinkraus** | PHOTOGRAPHY: **Martin Cherry**

After college Jenny Moss wanted a job involving nature and animals. Low pay for natural resources jobs quickly ended that notion, and she found herself with a career in water and wastewater.

She is now director of water and wastewater at the Hopkinsville (Kentucky) Water Environment Authority. She grew up in Hopkinsville, a community of about 31,000 about 70 miles northwest of Nashville.

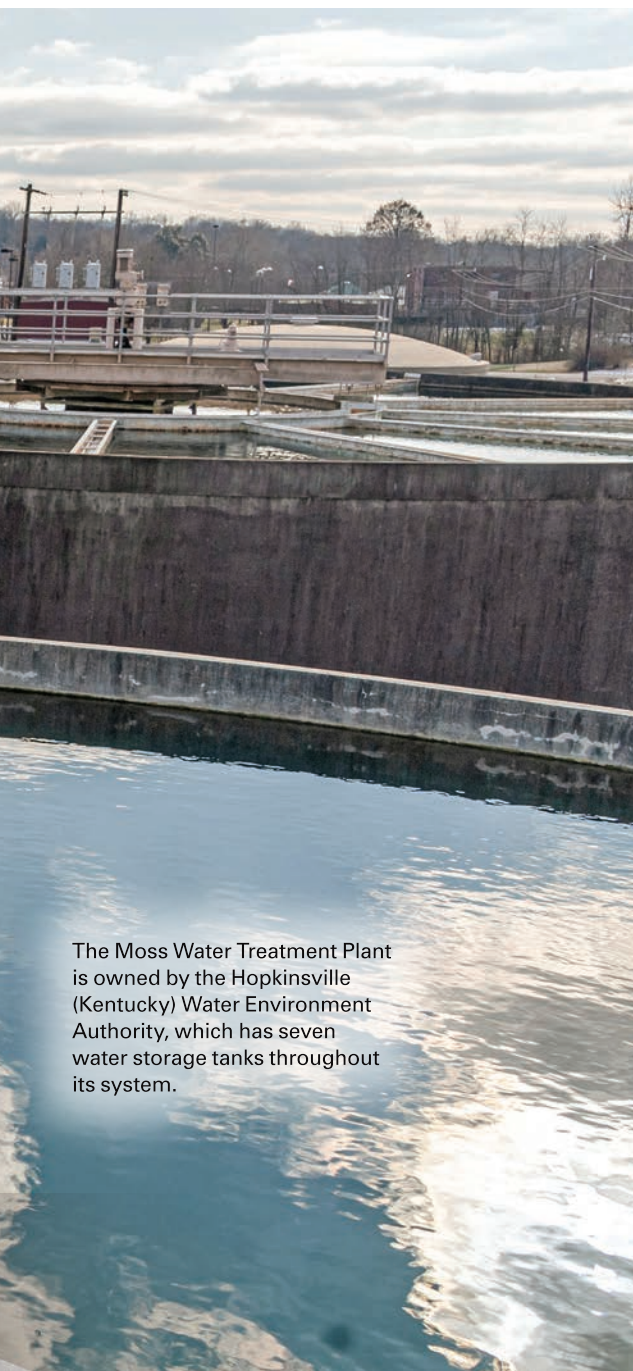
In 2020, the city's Moss Water Treatment Plant won the statewide Outstanding Operations Award from the Kentucky Water and Wastewater Operators Association. It's named for MacKenzie Moss, former general manager of the authority. He wasn't related to Jenny: "Not even the same family line. I do joke that it's named after me."

SCIENCE-FOCUSED

As a high school student, Moss thought she wanted to attend veterinary school, but decided against that. "A lot of the opportunities I found after college, and also with internships, were grant-related," she recalls. "If you didn't get a grant, you didn't get paid. That didn't sound very appetizing, to fight for my paycheck every single year."

Moss' parents moved the family to Hopkinsville when Jenny was very young. She left for college in Lexington and then moved back at a stage of life when many young people are attracted to large cities: "I fell in love with a guy who already worked here, and I married him, and that's why we ended up here."

"All of our parents lived here, and when we started our family, we wanted them close. I always thought I



The Moss Water Treatment Plant is owned by the Hopkinsville (Kentucky) Water Environment Authority, which has seven water storage tanks throughout its system.

wanted to live in a big city, but now, in hindsight, I'm glad that I didn't." After college graduation in 1994, she commuted to work in the chemistry lab of the GE Aviation aircraft engine plant in Madisonville, about 45 minutes north of Hopkinsville.

She learned how aircraft engines are built, but after six months she was hired as pretreatment coordinator in Hopkinsville, handling compliance, sampling and other tasks involving industrial wastewater customers. It was a full-time job with no commute. "I had a friend who worked here and knew that it was a good place to be," she says. "Losing that hour and a half commute every day was worth it."

Moss has been in her present job since 2012. Her zoology degree meant she learned quite a bit of chemistry and biology, so when the lab analyst retired, she was

assigned to the lab part-time. She recalls, "Kind of cold turkey they dropped me out there and said, 'Figure this out.' I managed to do that. That's where I learned about the wastewater side of our business."

She didn't learn about drinking water until a few years later when the state decreed that any water plant lab had to be supervised by someone with a four-year degree in certain fields of study. "And I happened to be the only one here who had some version of a biology degree," Moss says. "Then I took on the water quality lab at the drinking water plant, fortunately with an analyst who knew what she was doing."

VARIED SOURCE WATER

The Moss drinking water plant uses surface sources but is unusual in having three ways to bring water in. Lake Barkley, 27 miles away, is the primary source.

Jenny Moss
Hopkinsville, Kentucky



POSITION:
Director of Water and Wastewater

EXPERIENCE:
26 years

EDUCATION:
Bachelor's degree, zoology, University of Kentucky

GOAL:
Provide excellent drinking water and produce high-quality wastewater effluent

“Now I'm proud to say our drinking water supervisor is a woman. Both of our laboratory water quality specialists for drinking water and wastewater are women.”

JENNY MOSS

Jenny Moss,
director of water
and wastewater



It was created by a dam on the Cumberland River and is part of the Land Between the Lakes National Recreation Area. The pipeline can deliver 20 mgd directly to the plant.

The second source is the South Quarry. It can be filled from the Lake Barkley pipeline, and then the plant can draw from it. "The South Quarry acts as a primary settling basin," Moss says. "If we've had a lot of rain and the lake water quality is not that great, we can turn it off so we don't cause a problem for our raw turbidity level."

The third source is the North Quarry. It is spring-fed, so the water is very cold and clear. "In summertime when water quality tends to get bad due to low water levels, warm water and growing algae, we can use that North Quarry source. We also don't have to use as much chemical treatment," Moss says. Cold water also reduces formation of disinfection byproducts.



Jenny Moss (right), shown with plant supervisor Nikki Chambers, started her career in the private sector, in the chemistry lab at an aircraft engine plant.

The availability of the quarries means turbidity coming from Lake Barkley can be managed before it reaches the plant filters. Managing high turbidity inside the plant would require multiple filter backwashes and plenty of coagulant to drop sediment in the clarifiers, which then would have to be cleaned more often.

The water plant has a design capacity of 15 mgd. Raw water is treated with polyaluminum chloride, sodium permanganate and chlorine. After flowing through a static mixer vault, it passes through clarifiers and then a sand and anthracite filter. Final steps are adding chlorine and fluorine, along with and polyphosphate to reduce corrosion.

Moss observes, "I'm proud to say that Nikki Chambers, our plant supervisor, and Charlie Lane, our chief operator, have done a brilliant job making sure our plant makes the area-wide optimization program standard." AWOP is a set of techniques and tools to improve water treatment to which the utility committed 2011-13, and from 2017 to the present.

The other plant team members are Chandra Henderson, water quality specialist and operator; plant operators Ray Decoursey, Robert Tubbs, John Hall, Doug Montgomery and Randy Hunt; Terry Meacham, distribution system operator; and water treatment plant trainees Ben Gore and Kevin Duncan.

THREE WASTEWATER PLANTS

Moss oversees three wastewater plants and one water plant. The Crofton Wastewater Treatment Plant is a 0.2 mgd lagoon system with no on-site staff. The Hammond-Woods Wastewater Plant (6 mgd design, 4.5 mgd average) and the Oak Grove Wastewater Plant (0.72 mgd design, 0.45 mgd average) use oxidation ditch processes.

Each plant has a supervisor who oversees the entire plant and a chief operator who manages operations:

Hammond-Woods: Stephen Greenwell, supervisor; Bradford Carroll, chief operator; Judy Wayte, water quality specialist and operator; and operators Terry Frogue, Dalton McGregor and JB Hendrix and WWTP trainee Keith Mahone.

Oak Grove: Leroy Adams, supervisor; Jamel Lee, chief operator; operators Billy Ervin, D'Arsy Davis, and Dylan Crick.

(continued)

HIRING CLOSE TO HOME

Like many utilities, the Hopkinsville Water Environment Authority has struggled with a shortage of operators. The solution is old-fashioned, not high-tech.

"We've found that the best way to find employees in general, and hopefully operators, is by word of mouth," says Jenny Moss, director of water and wastewater. "If an employee has a friend who wants to come to work for us, that's the best way to find new people. No one who works here is going to recommend someone who won't be a good employee."

An advantage of this approach is that it recruits local people who are more likely to stay in the community: "People aren't always real keen to pull up their roots and move their whole family. We've hired those people before, and they tend not to stay."

A few young people have moved on to Nashville, about 70 miles away. Some leave for higher salaries or a path into management; advancement in Hopkinsville can be slow. "I've been here

for almost 27 years, so whoever wants my spot has been waiting for a while," Moss says.

For water plant operators, she prefers people who have had some college education because it reduces the time they need to spend on the job before taking the state licensing exam. That's less an issue for wastewater operators because the state requires experience for exam eligibility.

Someone straight out of high school would have to work at the drinking water plant for four years to be eligible for an operator's exam; someone with a four-year degree in a field like biology or chemistry has to work for only a year.

Of the utility's seven drinking water operators, five will be eligible for retirement in the next five years. "I have to start looking for some trainees pretty soon who are eligible to sit and pass their exams quickly," says Moss.

One operator retired but returned to work part time. That may be an option for people who want to only reduce their hours.

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“The teams at all the plants are outstanding, to say the least. And I’m very proud to be part of those teams.”

JENNY MOSS

SHIFTING SHIFTS

Shifts have changed over the years. “We’re having trouble finding new water plant operators, and so there was a time, for quite a while, when our operators were working 12-hour shifts around the clock,” says Moss. That makes for a tough week, especially on the overnight shift.

Now each operator typically works a week of first shifts (7:30 a.m. to 4:30 p.m.), a week of second shifts (3:30 p.m. to 11:30 p.m.) and a week of third shifts (11:30 p.m. to 7:30 a.m.). There is an official schedule, but operators are allowed to rearrange it to suit their needs while making sure their shifts are covered.

In the beginning, when she wasn’t a supervisor, there were challenges. “I was young. I was 23, 24, so I had both my age and my gender working against me,” Moss says. “I admittedly didn’t know anything. I had no knowledge to back myself up with.” At trainings she was typically the only woman in the room, but no one was rude or inappropriate.



The team at the Hopkinsville Water Environment Authority includes, front, from left: Kevin Duncan, trainee; Nikki Chambers, plant supervisor, Moss Water Treatment Plant; Jenny Moss, director of water and wastewater; Chandra Henderson, water quality specialist; and Ben Gore, trainee. Back, John Hall, operator; and Charlie Lane, chief operator, Moss Water Treatment Plant.



The Moss Water Treatment Plant opened in 1997. It was expanded and renovated in 2012 to serve four counties in Southwest Kentucky.

“Now I’m proud to say our drinking water plant supervisor is a woman,” she says. “Both of our laboratory water quality specialists for drinking water and wastewater are women.” Moss would love to hire more women but doesn’t have the luxury of being choosy because of the overall operator shortage.

WASTEWATER UPGRADE

Among challenges facing Moss is an expansion of the Hammond-Woods wastewater plant to 9 mgd capacity. The plant was built in 1983 and renovated in 1995. The community is seeing industrial and residential growth,

and the equipment and processes installed in 1995 are worn out. The total project will cost about \$45 million.

Moss was involved in early discussions about the upgrade just after she started her current job in 2012. Now the project is underway and about half done: “We are adding a Sulzer ABS anaerobic reactor that will help with nutrient removal because we understand the state will eventually put phosphorus and total nitrogen limits in our discharge permit, which we don’t currently have.”

Biosolids will be dewatered on a Schwing Bioset screw press, which won’t require constant operator attention. A new operations building is under construction; the present one dates to 1983. “I was excited to give the staff new offices, an operator control room which they’ve never had, lots of space for a new water quality laboratory, and a state-of-the-art treatment plant,” Moss says.

The present plant is doing its job and operates within its permit, “But every day is a challenge for the operators because something is always breaking down.” Hammond-Woods will get ABB electromagnetic flowmeters, Kurz Instruments air flow meters, Precision Digital digital process meters and Metso solids meters to reduce the need for manual operations, and the utility’s first wastewater treatment plant SCADA system. (The water plant already has SCADA.)

“I want to give all of the praise to my team,” says Moss. “They do all of the work, maintain all the facilities. The teams at all the plants are outstanding, to say the least. And I’m very proud to be part of those teams.” **tpo**

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Young Minds at Work

A GLOBAL INNOVATION CHALLENGE LETS STUDENTS WORLDWIDE COMPETE FOR CASH PRIZES AS THEY DEVISE POTENTIAL SOLUTIONS TO THE WORLD'S PRESSING WATER PROBLEMS

By Ted J. Rulseh

The water and wastewater sector depends on a new generation of devoted professionals to replace those retiring by the thousands. And solutions to the world's water problems depend on new ideas and innovative technologies.

To serve those ends, Xylem has devised the Global Student Innovation Challenge (innovationchallenge.xylem.com) for high school and college students worldwide. This was the second year of the competition.

Students competed for eight cash prizes from a \$20,000 pool. Over eight weeks, the students submitted solutions to one of four challenge statements; they had access to master classes and support from mentors across the water industry. The challenges included the following:

- Keeping the Water Flowing in Rural Communities
- Smart Floating City Master Plan
- Data Storytelling for Water Insecurity
- Kickstarting Water's Race to Net Zero

Participants worked in teams of up to five to compete for prizes for the top high school and college projects. Austin Alexander, vice president of sustainability and social impact, and Leo Huang, leader of the Global Student Innovation Challenge, talked about the program in an interview with *Treatment Plant Operator*.

tpo: Why did Xylem create this competition?

Alexander: We have a long history of engaging youth, particularly through the Stockholm Junior Water Prize. In 2019 we decided to step it up, for two primary reasons. First, it gives us access to the best talent, and we want to make sure those people are coming to Xylem, or to the water sector. Second, these students, even though many are still in high school, are coming up with real, innovative and meaningful projects that in many cases can make a big difference.

tpo: How would you define the purpose of the Global Student Innovation Challenge?

Huang: The Innovation Challenge is part of our Xylem Ignite Global Student Development Program. It was conceived by a team of young professionals in the company as a way to engage students' passion and creativity. The purpose of the Innovation Challenge is to reach out to youth regarding water-related issues and to spark innovation and interest early on in their educational stage.

tpo: How well was the first challenge received?

Huang: We engaged more than 650 students around the world, coming from more than 45 countries. We also engaged our staff members internally, as more than 30 of our employees volunteered to be mentors for the event. This year we attracted some 800 students from 51 countries.

tpo: How do you promote the Innovation Challenge?

Huang: We partner with a third-party event organizer who helps us with logistics and marketing, but more important, within Xylem we have a database of student contacts that we leverage around the world. We have regional leads for the youth program in different geographical areas, and

they leverage their local channels to promote the event. We translate our welcome email and our marketing materials into different languages to accommodate students globally.



Austin Alexander



Leo Huang

Alexander: We are already engaged with a lot of students around the world through other events, such as the Stockholm Junior Water Prize. Innovation Challenge allows us to reach back out to students who may have been involved in a water-related challenge before, and offer a high-touch event for them to take part in. Many of the students are already interested in water and have already engaged somewhere along the path. We're trying to create an environment where we can keep them close and have a long-term engagement with them.

tpo: In basic terms, how is the competition structured?

Huang: The challenge is open to students from 13 to 25 years old. Each year we provide four different challenge statements. We design them so that students at different education levels and different ages and backgrounds are able to tackle one of the problems. So, for example, two of them are more technical, aiming toward students with STEM backgrounds. The other two are more open-ended so that any student could tackle them. We designed the program to be inclusive of people around the world. It doesn't matter where they're from, what language they speak, or what technical skills they have.

“One of the great features of the Innovation Challenge is the matching of mentors and student teams so that the students can have a fully immersive experience.”

LEO HUANG

tpo: How are the four challenge statements selected?

Huang: The program is a collaboration among Xylem colleagues around the world. Teams work in their spare time to come up with the challenges. We construct the challenge statements carefully to create the best fit for the students. We want them to address real-world challenges: something that's meaningful and can have a significant impact on the water industry.

tpo: How much work is involved for students?

Huang: The end deliverable for the project is a five- to seven-minute video where they present the results of their project. We care most about the approach the students take, as opposed to the detail that they would be able to provide. For example, last year one of the challenges was to design a video game. We didn't expect them to create a fully functional video game that

“These students really are some of the best and brightest. The projects are what you would expect from college graduate work in many cases.”

AUSTIN ALEXANDER

someone could play. We focused on what message they were trying to deliver; the purpose of the end product they were trying to present to the audience.

tpo: Besides mentors from Xylem, what other help is available to the students?

Huang: One of the great features of the Innovation Challenge is the matching of mentors and student teams so that students can have a fully immersive experience. On top of that, we provide a resource package to help them get started. Once they sign up, they can access the resource tab on our online platform for an information package about the four challenge statements. We also have webinars to help students get started.

tpo: Can they work with their high school teachers or college professors?

Huang: Yes, but we stress that whatever help they get should not be solution-driven. It should be a thinking approach, a strategy by which to go about solving the problem.

tpo: Can students work either in teams or as individuals?

Huang: Yes, but most of them compete in teams. For those who don't have a team, we offer a team formation webinar. There are also channels on Slack and our event platform to help them find teammates. The webinar helps them get to know students around the world. The program is virtual so, for example, someone in the United States could team up with someone in India, as long as they are aware of the time difference and can arrange to work together effectively.

tpo: How are the projects submissions evaluated?

Huang: Our mentors did a pre-screening of the projects to make sure all the information was there. Then we used a judging rubric to evaluate each project.

tpo: How would you assess the quality of the responses to the challenge statements?

Alexander: I was on the judging panel last year, and it was incredible what some of these students pulled together in a matter of a few weeks. For example, the responses to video game challenge involved advanced-level computer science. Across the board we saw intricate thinking about the broader impact of the projects: How would it impact the community? Was it sustainable over time? In the case of projects involving products, how would they be operated and maintained? These students really are some of the best and brightest. The projects are what you would expect from college graduate work in many cases.

tpo: How are the winning students and projects recognized?

Huang: We hold an award ceremony. It is a virtual presentation that is livestreamed on our Xylem platform and is open to students all around the world.

tpo: Do any of the projects advance from concept to real-world application?

Alexander: For a couple of the winning projects in 2021, we saw that there was some potential, and the students were interested in taking that farther. So we assigned them long-term mentors who worked with them through the rest of the year. Nothing has come to market out of those projects, but it gave the students a chance not only to think more deeply about their projects but also about how their ideas might be commercialized. Working on an innovative challenge that they're passionate about, with an industry partner, is a pretty rare combination. We hope it's something valuable to students as they go on to college and after. **tpo**

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Help On the Way

DO-IT-YOURSELF PROJECTS CAN BE GREAT, BUT ORIGINAL EQUIPMENT MANUFACTURERS OFTEN ADD VALUE WHEN UPGRADING AND OPTIMIZING TREATMENT PLANT EQUIPMENT

By Doug Pimlott

The annals of home ownership are filled with stories of do-it-yourself projects gone wrong.

Operators of water and wastewater treatment plants are more mechanically savvy than the typical homeowner, and yet even they can often benefit from the advice of an equipment manufacturer when undertaking a repair, upgrade or optimization project.

Plant owners and equipment manufacturers have a shared interest in seeing the process operate reliably and efficiently. Most likely, your equipment supplier has seen your particular issue many times before and will have the knowledge, experience and parts to help you do what is necessary.

This expertise can be all the more helpful in a time when many facilities are stretched for funding and have seen their maintenance staffs reduced. For rehabilitation work in particular, high-quality manufacturers have groups of specialists who can do the work for you.

For example, a facility in Florida replacing a clarifier drive discovered during construction that the center pier was corroded all the way through. It was a safety issue because the pier was the primary support for the access bridge. While the clarifier was down, the manufacturer fabricated a pier in one week and brought the unit back to a safe and operable condition with minimal downtime.

In addition, a high-quality manufacturer will have a valid contractor's license in your state and will provide insurance in which your municipality or company is named as the certificate holder. The completed project also comes with a warranty covering both parts and labor. Here are some basic tips for working effectively with an original equipment manufacturer to extend equipment life, improve performance and reduce maintenance.

GATHER THE INFO

The manufacturer needs to know the specific piece of equipment that needs attention. If at all possible, know the original project number before calling. Typically, you can find this on the cover of operations and maintenance manual in the title box of the manufacturer's drawings, or on the equipment itself. Then the manufacturer can access the correct bill of materials and drawings to understand the exact issue and find a solution.

But what if the documents have been lost? Many times, plant personnel have said, "You're not going to believe this, but all our documents were destroyed in a flood." In that case the equipment's steel nameplate is always stamped with the manufacturer's name and the original project number.

Unfortunately, nameplates are often affixed to steel or plastic chain guards or other parts that have deteriorated over the years and have been replaced. In this event, the control panel can be a treasure trove of information that has been shielded from the elements. In the panel you can often find the schematic drawings, which will include the project number. (Be sure to lock out/tag out the equipment in accord with OSHA and local standards before opening any panel.)

If you can't locate the original project number, don't worry: Any good manufacturer will be able to find it in their records. In one case, a refinery



Between corrosion, maintenance, and changes in flow, keeping a clarifier working at peak performance can be challenging. Complimentary inspection by OEMs for circular or rectangular clarifiers help assess equipment condition and performance. (Tow-Bro clarifier from Evoqua Water Technologies)

on the West Coast had a clarifier that was shearing pins daily. The operator was new and had no idea what the bottom of the tank even looked like; the manuals had been lost many years ago.

In this instance the manufacturer was able to re-create the manual and talk through and troubleshoot the issues over the phone. The customer then ordered the materials in advance and changed out the parts while being down for only a day.

In cases like these it's necessary to report the equipment type, city and state. If you're in a small town and need to work on a circular clarifier, that information will probably suffice. However, in a large metropolitan area where there probably are multiple plants and clarifiers and possibly many retrofit or upgrade projects, some information about dimensions and key attributes will narrow down the search.

For example, saying that it's a 65-foot half-bridge clarifier and naming the treatment plant should enable the manufacturer to locate the specific files.

DIGGING DEEPER

Here are some additional steps you can take to make sure you and manufacturer understand the equipment and the issue you are facing:

Take pictures

This is a huge plus for the digital age. Show overall pictures of the equipment as well as close-ups that help illustrate the problem. Pictures taken with a good-quality smartphone are usually sufficient. These pictures can assist in the diagnosis and ensure that everyone is on the same page about the equipment type.

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Get the drawings

If you have lost your general arrangement drawings, ask the manufacturer for a copy. The manufacturer likely will not send you custom fabrication or proprietary drawings but will gladly send general arrangement and assembly drawings that would have been in your operations and maintenance manual. Electronically transferred documents can be kept on a network as a permanent reference or as a backup to paper-based drawings.

Tell the truth

If, for example, you didn't know that a certain compartment needed an oil change every six months and you have not changed it in years, let the manufacturer know. If there has been a failure, your contact will likely ask a series of questions to get to the root cause; this helps in arriving at a good diagnosis and supplying the materials needed to fix the problem.

Most likely, your equipment supplier has seen your particular issue many times before and will have the knowledge, experience and parts to help you do what is necessary.

Ask for an inspection

Your manufacturer most likely can provide a complimentary qualified inspection to assess your equipment's condition and operational performance. After that, you will receive a detailed report including full documentation of the inspection along with recommendations for rehabilitation, upgrades or replacement options.

Inspection greatly benefited an industrial facility in Alabama. Plant operators thought they needed a new drive for a clarifier they depended on to produce their product and were worried about the time and cost of replacement.

A free inspection found that only some topside bearings needed replacing; they did the work without draining the clarifier and saved more than \$60,000 in materials and labor.

STRAIGHT TO THE SOURCE

You shouldn't need to contact third parties for replacement components. Bearing houses, for example, can be convenient and quick, but they are generalists and serve many industries. Manufacturers often hear from treatment plant operators that they have ordered parts three different times and none of them fit. Even worse, they do fit physically but then cause further damage to the machine because their form and function differ from the original.

It is also common for a bearing house to simply call the manufacturer to procure the parts; this adds time and money to the solution and puts an unnecessary person in the mix in the event things do not go as planned.

PICK UP THE PHONE

Finally, don't hesitate to call the manufacturer. Specialists there can guide you through the process and make sure you start out on the right road. Your manufacturer can help you with a full range of projects including:

- **Restoration:** Rehabilitate your system to improve operational efficiency and extend life
- **Installation:** A single source of responsibility for components and labor
- **Updating:** Adding components and systems that improve capacity and performance with little or no structural modification.

ABOUT THE AUTHOR

Doug Pimlott (douglas.pimlott@evoqua.com) is director of aftermarket with Evoqua Water Technologies. **tpo**



From Chaos Comes Order

JUSTIN MYERS WALKED INTO A NEW JOB AT A PLANT IN THE MIDDLE OF A MAJOR UPGRADE. WITH HIS TEAM, HE SAW IT TO COMPLETION AND A RECORD OF EXEMPLARY PERFORMANCE.

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



“There were times I would get off work, take a shower at work, and head straight to school until 9 or 10 at night.”

JUSTIN MYERS



Justin Myers, right, operations superintendent, and operator Kylin Mayberry, at the Little Patuxent Water Reclamation Plant, check parameters on the odor-control panel in the dryer building (BIOREM Technologies).

Imagine you buy a house and on the day you're to move in it is half finished and teeming with construction workers.

That's a bit like what Justin Myers experienced in 2017 when he stepped in as operations superintendent at the Little Patuxent Water Reclamation Plant in Howard County, Maryland.

"They were building a whole new Class A biosolids facility," he recalls. "They were literally just putting the walls up for the digesters. I came in at the beginning of that three-year project." It's not as if he didn't see the challenge coming; he envisioned his new role as a learning experience and a chance to lead a large facility after 17 years operating and overseeing smaller plants.

Consulting closely with his team of supervisors, Myers led the operations team through a host of trying events while helping them get trained up on the new process and equipment. In the end, the project received an Envision Silver Award from the Institute for Sustainable Infrastructure. Through it all the plant continuously met strict permit limits with ample room to spare.

Justin Myers

Howard County, Maryland



POSITION:
**Operations superintendent,
Little Patuxent Water Reclamation Plant**

EXPERIENCE:
22 years in the industry

EDUCATION:
**Bachelor's and master's degrees, environmental
management, University of Maryland Global Campus**

CERTIFICATIONS:
**Class 5 Advanced Wastewater Operator, Class 4
Wastewater Operator, Class 4 Water Treatment
Operator, Class 2 Wastewater Collections, Class 1
Water Distribution Wastewater Superintendent,
Water Superintendent**

AWARD:
**2021 William D. Hatfield Award, Chesapeake Water
Environment Association**

GOALS:
**Keep the environment clean, continue learning,
increase responsibilities**



Justin Myers (left) observes as Mark Ratliff, operations supervisor, hoses a secondary clarifier that has been taken out of service for maintenance.

“There were weekly meetings with the construction and design engineers, at the same time I had to introduce myself to the staff and all the operators,” says Myers, a 2021 winner of the William D. Hatfield Award from the Chesapeake Water Environment Association. “I had a lot of help from our supervisors. It was a team effort.”

COMPETITION AS CROSS-TRAINING

The Water Environment Federation Operations Challenge has become a training venue for the team at the Little Patuxent Water Reclamation Plant.

Justin Myers, operations superintendent, assembles a team to compete at the annual Tri-Association Conference with the aim to qualify for the national competition at WEFTEC. The conference includes the Chesapeake Water Environment Association, the Chesapeake AWWA Section, and the Water and Wastewater Operators of Maryland, Delaware and D.C.

“In a larger plant, the operators don’t really get training on going inside the mechanical aspects, such as pumps,” Myers says. “The Operations Challenge gives them the opportunity to tear pumps apart and work with the maintenance team members. And vice versa, it allows the maintenance team to get in the lab and run some of the ammonia tests and nitrogen tests.”

In 2021, WEF created a third division for new teams. A crew from Little Patuxent, called the Wet Bandits, placed fourth overall in that division and second in the process control event.

Myers led Operations Challenge teams for two years while with Maryland Environmental Service. When he came to Little Patuxent Robert Hindt, plant administrative manager, asked him to form a team there. “I agreed to do it, and I’m glad I did,” he says. “It has been a morale booster for the operations staff.

“I open it up every year. I have a list hanging for anyone who is interested in trying out. I created a little exam that they take with a couple of formulas on it and some multiple choice questions. Then I have live scenarios, like a lab event and abbreviated tasks for them to do. I grade them on their performance and pick the winners.”

STARTING SMALL

Myers’ clean-water career began in 2000 after high school in Reisterstown, Maryland, when he became an apprentice with Maryland Environmental Service, a state-affiliated agency whose functions include operating small-community water and wastewater treatment facilities.

As an apprentice, Myers was stationed at the 2 mgd (design) Freedom District Wastewater Treatment Plant serving Eldersburg and Sykesville. While there he earned his Class 5A Wastewater Treatment Operator license and took night classes to earn a general associate degree from the Community College of Baltimore County.

“There were times I would get off work, take a shower at work, and head straight to school until 9 or 10 at night,” he says. He went on to earn bachelor’s and master’s degrees in environmental management at the University of Maryland Global Campus.

After five years at the Freedom District he worked two years for MES as an environmental systems supervisor for the central region, and then 10 years as an assistant regional supervisor for MES, with operations, process control, performance monitoring and other responsibilities in overseeing multiple community treatment plants.

Then he found the opportunity at Little Patuxent (29 mgd design, 18 mgd average): “I was looking for new experiences,” says Myers. “I had been with MES for a good bit, and I always wondered what it would be like working at a larger facility. The largest one I worked at before Little Patuxent was the Freedom District plant where I started as an apprentice.”

WORK IN PROGRESS


Myers counts his work during the biosolids project as his proudest career accomplishment so far. It included new anaerobic digesters, new gravity belt thickeners (Alfa Laval), a MagPrex struvite removal process (Centrisys/CNP), centrifuge control upgrades (Alfa Laval), belt dryers (Haarslev Industries) and biogas utilization for the drying process and digester heating (Unison Solutions).

“It was the biggest addition the plant has had,” Myers says. “I had to learn and run the plant while getting up to speed with the new project.” He leaned heavily on key members of the team, including Robert Hindt, plant administrative manager; Bruce Taylor, maintenance superintendent; Johnny Good, maintenance supervisor; Sonya Williams and Angela Gruenfelder, engineering support and lab operations; and Mark Ratliff, Charles Heine, Lewis Lockhart and Timothy McFarland, operations supervisors.

At the same time, smaller projects were in progress, including the rebuild of a denitrification filter, and installation of four new influent pumps (Flygt). Among the challenges were numerous shutdowns of equipment so the new lines and equipment could be tied into the process.

“There were countless shutdowns, countless samples to be taken and numerous meetings to organize everything,” Myers says. “There was a tremendous amount of coordination between the operations staff and the engineers. I would get the supervisors together to go over the shutdown requests. We walked the plant, they showed me around, and I signed off on them.


“There was one shutdown we called the blitz. They were replacing our only conveyor carrying biosolids from the centrifuges. We had 48 hours to get the new conveyor in before our storage tanks were full. There was very little room for error. Those were some really stressful times.”



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REMOVING NUTRIENTS

In the new solids process, waste activated and primary sludges are gravity belt thickened separately (Alfa Laval) and fed to the digesters. Next comes the MagPrex process where salt is added and the material is aerated to precipitate struvite crystals, which remain in the biosolids; this prevents struvite formation in downstream piping and the centrifuges.

The centrifuges dewater the material to about 20% solids; the direct thermal dryer yields a Class A product at 95% solids. Synagro delivers most of the material to farms for application; one local farmer also takes the product.

On the liquid side, septage is received in a Raptor micro-strainer (Lakeside Equipment) that collects and compact solids and sends the liquid on to treatment. Influent passes through bar screens (Mahr), grit settling tanks and a grit classifier (WEMCO) and on to the primary clarifiers.

The secondary biological nutrient removal process uses anaerobic, anoxic and oxic zones. It's followed by enhanced nutrient removal in seven denitrification filters (Leopold) where methanol is added as food for denitrifying bacteria in the sand-and-gravel media. After UV disinfection (WEDECO), effluent discharges to Little Patuxent River, a Chesapeake Bay tributary.



Myers walks with Kylin Mayberry to the new anaerobic digester facility.

The plant operates well below permit nutrient limits designed to protect the bay. The county was able last year to sell a portion of its nutrient credits. The permit loading limit for nitrogen is 309,715 pounds per year; actual discharges were 83,228 pounds. Phosphorus discharges were 18,687 pounds against a permit limit of 23,358 pounds per year.

“We take a lot of pride in our phosphorus removal because we don’t use a lot of chemicals, Myers says. “Our influent contains a lot of soluble fatty acids. We believe that’s from the milk and ice cream plants that feed our system. We’re able to get a lot of phosphorus removal naturally in our aeration basins.”

FOCUS ON TRAILING

It takes a well-trained and experienced team to deliver such results, Myers observes. Operators are encouraged to pursue increasing levels of licensing. “We offer training through Maryland Center for Environmental Training and the California State University, Sacramento, Office of Water Programs,” Myers reports.

“MCET provides in-person classroom training and online training; the Sacramento program is self-paced with take-home tests. Once new operators pass the exam and have three years of experience, they receive a promotion to operator II.”

“There’s always something happening. You can’t expect to come to work at a wastewater plant and have it be quiet.”

JUSTIN MYERS

Training was crucial during the transition to the new biosolids process; the focus has since turned to the wet side of the plant. Workdays include a turnover session after every shift so that the shift coming on knows what has happened in the plant previously.

Day by day, Myers relies on the team of supervisors for advice; that was especially true right after his arrival. “Every plant is different,” he says. “When you come into a new facility, you’re not going to know how that plant runs. It’s completely different, even if the theory is the same. Mixed liquor suspended solids at 2,500 mg/L may work at one plant, but at another plant you’ll violate at 2,500; you may need 3,000 or 3,500. You have to listen to the operators and supervisors.”

A separate maintenance division takes care of the water distribution system, the wastewater collection system and scheduled maintenance in the Little Patuxent plant. When operators on rounds find issues, a supervisor visits to assess the problem. If warranted, a work order is issued to the maintenance division with an assigned severity of 1 (needs immediate attention) to 4 (can wait a couple of weeks).

LOOKING AHEAD

At present, the GHD engineering firm is working on a facility site plan to cover the plant’s needs for the next 20 years. Meanwhile, several projects are in progress or recently completed. They include repairs to the denitrification filters in sequence, new rock traps for the septage receiving facility, and a sodium hypochlorite disinfection system for plant process water to prevent slime buildup in piping and pump cooling jackets.

Also in process is a pilot study for an automated wasting system for the aeration basins: “We’re having MLSS probes installed in the basins and the return activated sludge line so we can set up a program to waste automatically.”

For his career, Myers looks toward taking on increasing management and leadership responsibility, and he sees his master’s degree program helping. “It really emphasized teamwork,” he says. “In a lot of the classes I’ve taken, the final project had us in groups, all doing our part on a project and piecing it together at the end.”

For now, he enjoys his work situation: “I grew up playing outside most of the time. I’ve always enjoyed being outdoors fishing and hiking. Here, I’m



The team at the Little Patuxent Water Reclamation Plant includes, from left, Brian McGuire, lab technician; Mark Ratliff, operations supervisor; Angela Gruenfelder, lab manager; Troy Sigman, operator III; Sonya Williams, process control manager; Justin Myers, operations superintendent; Kylin Mayberry and Anthony Carr, Operator I; Jason Ludlow, operations supervisor; and James Meyer, Operator I.

not stuck in the office. I get out in the plant and walk around, and when there’s a problem, I go and check it out.

“No one wants to sit there and be bored at work all day. There’s always something happening. You can’t expect to come to work at a wastewater plant and have it be quiet. That’s not saying it isn’t stressful, but I do enjoy the challenge.” **tpo**

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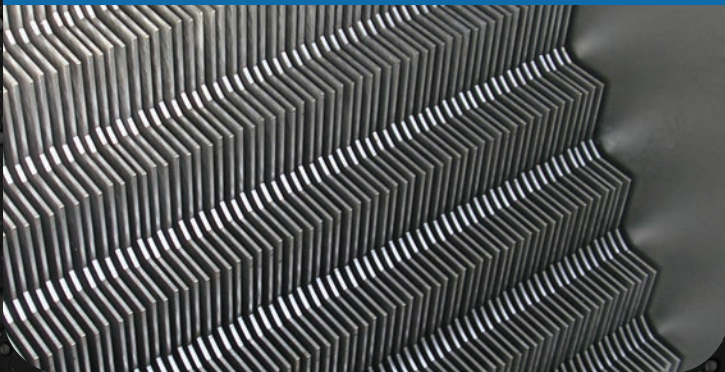
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A sampling of excellent works from entrants in the Carmichael Water District poster contest.



Poster Contest Comes Full Circle

THE CARMICHAEL WATER DISTRICT CREATES A WATER-WISE POSTER CONTEST TO ENGAGE MIDDLE SCHOOL STUDENTS ON WATER CONSERVATION

By Sandra Buettner

Chris Nelson of the Carmichael Water District had no idea when he won a poster calendar contest in middle school that the accomplishment would come back full circle.

Fast forward 30 years later and he is the public information officer for the California district. About 10 miles east of Sacramento, the district has provided water for more than 100 years to its residents, now numbering 43,000. The utility maintains 154 miles of waterlines.

REACHING OUT TO STUDENTS

In 2005, the utility was having a tough time reaching middle school students about the importance of water conservation and water efficiency. A district director at the time proposed an idea his Rotary Club had tried: a poster contest with the winning works included in a calendar.

The director brought some sample calendars to pitch the idea to Nelson. Lo and behold, the director had

brought a calendar from when Nelson had won the contest; Nelson immediately recognized his entry.

Nelson put a team together to brainstorm ideas and determine how the contest would be administered, judged and awarded. He engaged the Kiwanis



Winners of the Carmichael Water District poster contest display their creations.

“Each year the submissions are like a snapshot in time. This past year with COVID, the artwork included the students in their submissions wearing masks because they were learning from home.”

CHRIS NELSON

Club to sponsor the program with the utility. Barrett Middle School was the first in the service area to try the contest.

The calendar team includes staff from the district and representatives from the Kiwanis Club and Barrett Middle School; they meet every year to create a theme for the students' artworks. "This can be challenging because the contest is going on its 15th year," says Nelson.

RULES OF ENGAGEMENT

The contest kicks off in September when the students return to school. The deadline for submissions is mid-October. The submissions must be original and cannot use any logos. The competition is promoted through the Kiwanis Club, middle school teachers, the district's website and social media.

The calendar team meets in the school principal's office to judge the entries. Up to 200 entries are typically submitted; winners are announced at the end of October. The winning entries are printed in a calendar, distributed in December and given away to district residents. The utility also distributes them at community outreach events and keeps a supply at its service counter.

"Each year the submissions are like a snapshot in time," Nelson says. "When the area is experiencing flooding or droughts, the students incorporate those issues into their submissions. This past year with COVID, the artwork included the students in their submissions wearing masks because they were learning from home."

CELEBRATING THE WINNERS

The district holds a pizza party right before one of its board meetings where the winning entries, made into large posters, are displayed. "It's like an art gallery," Nelson says. "The students explain their entries, and we celebrate their creativity."

A big crowd attends every year, including school children and their families, along with utility staffers and board members. Each winner gets a \$25 gift card; the grand prize winner receiving a \$75 gift card provided by the Kiwanis Club.

Going forward, there might be some changes. "We learned some things during the pandemic, such that calendars are going more digital," says Nelson. Because many students have calendars on their phones, the district is considering making the contest calendars available for viewing on that medium.

The district is also contemplating expanding the contest to more middle schools to cast a wider net in teaching about water conservation and efficiency. **tpo**

What's Your Story?

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

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 ANUE <small>WATER TECHNOLOGIES</small> See ad on page 9		✓						
 Aqualitec <small>Screening Equipment & Sludge Treatment</small>								
 BDP Industries, Inc. See ad on page 11		✓			✓			
 Bright Technologies See ad on page 51	✓						✓	
 Charter Machine Company See ad on page 35		✓	✓					
 CleanTek <small>WATER SOLUTIONS</small>							✓	
 CRANE PUMPS & SYSTEMS See ad on page 5								
 DUPERON See ad on page 15							✓	
 E&I Corporation <small>a Division of Michlin Corporation</small> See ad on page 61							✓	
 Eagle Microsystems, Inc. See ad on page 59				✓				
 ELGIN			✓					
 ELODE USA, Inc. <small>Electro Osmosis Dehydrator</small> See ad on page 31		✓	✓					
 EVOQUA <small>WATER TECHNOLOGIES</small>								✓
 FEDERAL <small>SCREEN PRODUCTS INC</small>								
 FKC <small>SCREW PRESS</small> See ad on page 55								

	Grinders/ Shredders	Grit Handling/ Removal/Hauling	Headworks	Pumps - Archimedes/ Screw	Screens/Strainers/ Screening Systems	Screw Conveyors	Septage Receiving Stations	Sludge - Dewatering/ Presses	Sludge - Dryers	Sludge - Hauling/Disposal	Sludge - Heaters	Sludge - Land Application	Sludge - Mixers/Thickeners	Sludge - Screens	Other
			✓		✓			✓							
								✓							
								✓							
								✓	✓				✓		
		✓	✓		✓	✓	✓				✓		✓		Heat Exchangers
	✓														
	✓		✓		✓	✓	✓							✓	Washer Compactors
		✓	✓		✓	✓		✓						✓	Flocculators
				✓		✓		✓	✓						
								✓	✓				✓		
				✓				✓			✓		✓		
			✓		✓										Intake Screens
					✓	✓		✓					✓		

Headworks/Biosolids Management DIRECTORY | 2022

		Bins/Hoppers/ Silos	Biosolids Treatment/ Application	Centrifuges/ Separators	Chemical/Polymer Feed Equipment	Coagulants/ Flocculants/ Polymers	Composting Equipment	Conveyors	Digesters
 See ad on page 9	Fournier Industries 3787 Frontenac Blvd. W, Thetford Mines, QC G6H 2B5 Canada 418-423-4241 general@fournierindustries.com www.fournierdewatering.com	✓		✓	✓			✓	✓
	Headworks International, Inc. 11000 Brittmoore Park Dr., Houston, TX 77041 713-647-6667 Fax: 713-647-0999 hw@headworksintl.com www.headworksintl.com								
	HUBER Technology, Inc. 1009 Airlie Parkway, Denver, NC 28037 704-949-1010 Fax: 704-949-1020 marketing@hhusa.net www.huberforum.net								
 See ad on page 63	Hurst Boiler 100 Boilermaker Ln., Coolidge, GA 31738 877-994-8778 229-346-3545 Fax: 229-346-3874 info@hurstboiler.com www.hurstboiler.com		✓						
	Hydro International 2925 NE Alcock, Hillsboro, OR 97124 866-615-8130 503-615-8130 Fax: 503-615-2906 questions@hydro-int.com www.hydro-int.com								
	Hydro-Thermal Corporation 400 Pilot Ct., Waukesha, WI 53188 800-952-0121 262-548-8900 info@hydro-thermal.com www.hydro-thermal.com		✓						✓
 See ad on page 21	JDV Equipment Corporation 1 Princeton Ave., Dover, NJ 07801 973-366-6556 sean@jdvequipment.com www.jdvequipment.com	✓						✓	✓
 See ad on page 7	JWC Environmental 2850 S. Red Hill Ave., Santa Ana, CA 92705 800-331-2277 949-833-3888 jwce@jwce.com www.jwce.com								
 See ad on page 4	Komline-Sanderson 12 Holland Ave., Peapack, NJ 07977 800-225-5457 908-234-1000 Fax: 908-234-9487 info@komline.com www.komline.com		✓						
 See ad on page 51	Kuhn North America, Inc. P.O. Box 167, Brodhead, WI 53520 608-897-2131 Fax: 608-897-2561 chris.searles@kuhn.com www.kuhn-usa.com		✓				✓		
 See ad on page 3	Lakeside Equipment Corporation 1022 E Devon Ave., Bartlett, IL 60103 630-837-5640 Fax: 630-837-5647 sales@lakeside-equipment.com www.lakeside-equipment.com								
 See ad on page 19	Landia, Inc. 111 Triangle Trade Dr., Cary, NC 27513 919-466-0603 info@landiainc.com www.landiainc.com								
 See ad on page 2	Ovivo USA, LLC 2300 Greenhill Dr., Ste. 100, Round Rock, TX 78664 855-466-8486 512-834-6000 www.ovivowater.com		✓						
 See ad on page 60	Park Process 7015 Fairbanks N Houston Rd., Houston, TX 77040 855-511-7275 713-937-7602 Fax: 713-937-4254 russ@parkprocess.com www.parkprocess.com	✓	✓		✓	✓			
 See ad on page 37	Parkson Corporation 1401 W Cypress Creek Rd., Ste. 100, Ft. Lauderdale, FL 33309 888-727-5766 954-974-6610 Fax: 954-974-6182 technology@parkson.com www.parkson.com		✓					✓	

	Grinders/ Shredders	Grit Handling/ Removal/Hauling	Headworks	Pumps - Archimedes/ Screw	Screens/Strainers/ Screening Systems	Screw Conveyors	Septage Receiving Stations	Sludge - Dewatering/ Presses	Sludge - Dryers	Sludge - Hauling/Disposal	Sludge - Heaters	Sludge - Land Application	Sludge - Mixers/Thickeners	Sludge - Screens	Other
					✓	✓	✓	✓				✓	✓		Mobile Dewatering Units
			✓		✓	✓									
		✓	✓		✓	✓	✓	✓	✓			✓	✓		
															Heat Exchangers
		✓	✓										✓		
															Heat Exchangers
		✓	✓		✓	✓	✓	✓		✓	✓	✓			
	✓		✓		✓		✓					✓			
								✓	✓			✓			
										✓		✓			
		✓	✓	✓	✓	✓	✓					✓			Grease Screening
				✓											Digesters Mixers
		✓	✓		✓			✓				✓			
		✓			✓			✓							
		✓	✓	✓	✓	✓	✓	✓				✓			Sludge Removal

(continued)

Headworks/Biosolids Management DIRECTORY | 2022

	Bins/Hoppers/ Silos	Biosolids Treatment/ Application	Centrifuges/ Separators	Chemical/Polymer Feed Equipment	Coagulants/ Flocculants/ Polymers	Composting Equipment	Conveyors	Digesters
 PAXXO <i>— bag it right</i> See ad on page 8								
 Penn Valley Pump Co., Inc. 998 Easton Rd., Warrington, PA 18976 800-311-3311 215-343-8750 Fax: 215-343-8753 info@pennvalleypump.com www.pennvalleypump.com				✓				
 Press Technology & Mfg., Inc. 1401 Fotler St., Springfield, OH 45504 937-327-0755 dberner@presstechnology.com www.presstechnology.com		✓	✓					
 PRIME SOLUTION See ad on page 53		✓						
 Process Wastewater Technologies (PWTech) 9004 Yellow Brick Rd., Ste. D, Rosedale, MD 21237 410-238-7977 Fax: 410-238-7559 volute@pwtech.us www.pwtech.us		✓						
 Pulsed Hydraulics, Inc. 1 Oro Beach Dr., Oroville, WA 98844 800-641-1726 425-785-3225 info@phiwater.com www.phiwater.com								
 ROTO-MIX, LLC 2205 E Wyatt Earp Blvd., Dodge City, KS 67801 620-225-1142 Fax: 620-225-6370 info@rotomix.com www.rotomix.com						✓		
 Saf-T-Flo Chemical Injection 4091 E La Palma, Ste. U, Anaheim, CA 92807 800-957-2383 714-632-3013 Fax: 714-632-3350 info@safflo.com www.safflo.com				✓				
 SAVECO / Enviro-Care 1570 St. Paul Ave., Gurnee, IL 60031 815-636-8306 847-672-7968 www.savecowaterna.com							✓	
 Schwing Bioset, Inc. 350 SMC Dr., Somerset, WI 54025 715-247-3433 Fax: 715-247-3438 marketing@schwingbioset.com www.schwingbioset.com	✓	✓					✓	
 Screenco Systems LLC 13235 Spur Rd., Genesee, ID 83832 208-790-8770 sales@screencosystems.com www.Screencosystems.com							✓	
 Smith & Loveless, Inc. 14040 Santa Fe Trail Dr., Lenexa, KS 66215 800-898-9122 913-888-5201 Fax: 913-894-0488 answers@smithandloveless.com www.smithandloveless.com			✓				✓	✓
 USP technologies 5640 Cox Rd., Glen Allen, VA 23060 877-346-4262 www.usptechnologies.com		✓						
 Vaughan Company, Inc. 364 Monte-Elma Rd., Montesano, WA 98563 888-249-2467 360-249-4042 info@chopperpumps.com www.chopperpumps.com		✓						✓

tpomag.com August 2022 45



1

1. Netilion Water Network Insights connects all levels of water-supply systems so utilities can manage multiple control and data sources with a single interface.
2. Simple views of the status of measurement points around the network equip utilities to take appropriate actions.

2



Unified Monitoring for Water Networks

A CLOUD-BASED MONITORING SOLUTION OFFERS COMPREHENSIVE AUTOMATION AND SUPPORTS OPTIMIZATION FOR CRITICAL PARAMETERS, FROM ANYWHERE AT ANY TIME

By Ted J. Rulseh

Water and wastewater utilities constantly look for ways to make their networks operate more efficiently and to improve service reliability for customers.

Endress+Hauser now offers a cloud-based system that enables full transparency for water networks around the clock by providing reliable monitoring of flow, pressure, temperature, level, water quality and other parameters.

The software service, Netilion Water Network Insights, connects all levels of water supply systems, allowing utilities to manage multiple control and data sources through a single interface. These data sources include field devices, industrial controllers, data transfer components, data recording and archiving devices, analysis and forecasting tools, and others.

NWNI provides access to all measurement data gathered in a water network and transmitted to the cloud, whether users access the system from a control room computer, a laptop at home, a tablet in the field or smartphone on the move.

The web-based interface enables complete system monitoring. When limit values are exceeded or in the event of failure, it delivers alarms via email, SMS or push notifications. Ryan Williams, strategic business manager for digital transformation solutions with Endress+Hauser, talked about the technology in an interview with *Treatment Plant Operator*.

tpo: What market need were you looking to address with this technology?

Williams: We see the water industry continuing to leverage and use digitization in their operations and for monitoring of critical measurement

“The focus is on water, but the technology can be applied to municipalities, rivers and streams, and industrial users.”

RYAN WILLIAMS

points across their processes. As our smart transmitters have been enabling data, customers have been asking us to go to the next level, helping visualize what's going on with their flows and liquid analyses. We built the NWNI to provide those insights by way of a clear, cloud-based SCADA application.

tpo: How does this technology improve on traditional monitoring approaches?

Williams: In monitoring, knowledge is power. NWNI is an easy-to-use application that enables users to see, for example, whether they might need to add a pH or dissolved oxygen monitor upstream of a process point they currently monitoring. It gives them a simple, agile way to add measurement points. The ultimate goal is to drive insights around what is currently being monitored, and then to drive insights or actions on what to do next to improve efficiency. We enable customers to be innovative and to do more monitoring while still leveraging traditional systems. The technology gives them options and flexibility.

tpo: In what ways is the data displayed to help support decision-making?

“We’re able to give customers more options to monitor new points in new ways.”

RYAN WILLIAMS

Williams: The software includes evaluation tools like time curves, diagrams, tables and trend charts. By incorporating external data sources, such as weather prediction systems, users can create trend analyses and forecasts. Together, these tools help inform users about conditions like runoff during heavy rainfall or consumer water demand.

tpo: What is the range of applications where this technology is useful?

Williams: It’s not specific to any given site or industry segment. The focus is on water, but the technology can be applied to municipalities, rivers and streams, and industrial users.

tpo: How exactly does this method of network monitoring benefit users?

Williams: By having very simple views of what is going on with the measurement points around their network, they are equipped to take appropriate actions. We also see users looking at the technology from a reliability perspective. We call it water assurance: They want to make sure that all their monitoring assets are in good and healthy condition.

tpo: How is the reliability of measurements assured?

Williams: Within our instrumentation we leverage diagnostics. If an instrument is going out of tolerance because it is getting a coating or buildup, a smart transmitter notifies the NWN system, and the user is alerted that maintenance is required. In our flowmeters for example, we integrate Heartbeat Technology that provides measurement verification with the push of a button. Users can view automatically generated verification records in the NWN. So they spend less time getting in a truck and going to the monitoring points.

tpo: What are the key parameters measured in this monitoring system?

Williams: The primary values are flow, pressure, temperature, level and liquid analysis, which includes pH, dissolved oxygen and a whole suite of sensor types. We offer a full market basket of measuring technologies related to industrial process management.

tpo: Who at a water or wastewater utility would be most likely to use this technology?

Williams: There are multiple users, but so far, within organizations adopting the technology, it’s managers responsible for quality and process control. They want to ensure, for instance, that their permit limits will not be breached, and that their liquid analysis is accurate. On the drinking water side, we see utilities using it to make sure water is available based on consumption. They can monitor remotely to determine, for instance, whether they need more risers or more pumping capacity in certain areas.

tpo: How is the technology deployed on customer sites?

Williams: We deploy our instrumentation through a simple project style. As we look at what monitoring technologies need to be deployed, the setup of the cloud-based user interface is object-oriented. That makes it easy for customers to get started and to expand the system. We use common objects such as vessels and pipelines. The measurement technology is pre-engineered, but we also enable our engineers, or the customer, to tailor it to specific user preferences. Customers are free to make adjustments; if they need help, we’re there for them.

tpo: What is involved in adding monitoring points to a network?

Williams: We’re able to put measurement technologies into applications without the constraints of having to run power and communications.

SAF-T-FLO

CHEMICAL INJECTION



SAF-T-FLO retractable injection quills are designed to provide a maintenance friendly way of maintaining injection feeds prone to scale and clogging.

Rarely are any two injection points the same. Our wide range of sizes, materials, and unique features allows each quill to be configured for the intended application. No compromises, just the right tool for the job.

Key Features

- 1/2" to 3" Connection Sizes
- Restraint ratings of both 150psi and 250psi.
- Integrated check valves on select sizes.
- Does not require the main to be depressurized for insertion/removal.
- SAF-T-Seal Elastomeric Tip for excessive scale prone feeds.

Learn More

call: 800-957-2383

visit: www.saffflo.com

view: youtube.com/saffflo

Our flow transmitters, for example, essentially consist of a display and a little antenna. They have battery power, and they don’t require cabling and a hard-wired network because they’re leveraging radio and cellular. They don’t require physical infrastructure. We give customers more options to monitor new points in new ways.

tpo: How do you integrate this technology with customers’ existing SCADA or other control systems?

Williams: We have an open platform. Many customers leverage our connectivity protocols to share, push and transmit information between our cloud-based application and their traditional SCADA. We see customers using the connectivity of the cloud-based application for their business processes and big data needs, while leveraging NWN to monitor and efficiently operate their water networks. **tpo**

Headworks and Biosolids Management

By Craig Mandli

Belt Filter/Rotary Presses

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

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



Belt filter press from Bright Technologies, Division of Sebright Products

PRIME SOLUTION ROTARY FAN PRESS



Rotary Fan Press from Prime Solution

The Rotary Fan Press from Prime Solution is an efficient, sustainable system that provides a simple mechanical dewatering solution with a variety of sizes, plug-and-play systems, as well as customizable options available. With greater throughput for comparable size, the compact footprint allows the system to be easily retrofitted into tight spaces. Automation of the press makes it easy to walk away and focus on other tasks. Minimal maintenance and parts provide savings in time and money.

Low energy and water use reduce the impact on and cost of utilities. **269-694-6666; www.psirotary.com**

Biosolids Handling/Hauling/Disposal/Application

JDV EQUIPMENT LEVEL LODOR

The Level Lodor from JDV Equipment provides water quality professionals a means to dispose of processed waste, control odors and limit waste exposure to operators. It uses auto-leveling technology to level the waste material. This increases the fill percentage of a dumpster without operator intervention, slide gates or extensive control strategies, while lim-



Level Lodor from JDV Equipment

iting exposure to potentially hazardous material and working conditions. Made for indoor or outdoor use, it can save valuable indoor square footage or eliminate the need for additional building space by installing the system outdoors. The covers are custom made to cover standard 20-, 30- and 40-yard dumpsters, with an overall footprint barely larger than a standard dumpster. The shaftless option uses replaceable ultra-high molecular weight liners that will reduce screw wear. The shafted option can be used for increased efficiency and has easily accessible grease points. **973-366-6556; www.jdvequipment.com**

PAXXO LONGOPAC FILL

The Longopac Fill continuous bag system from Paxxo can connect to the discharge point of machines used to move, dewater or compact screenings, grit and biosolids. Material is then deposited in a 90-meter-long continuous bag for odor containment and spillage control. The cassette bag can be sealed with ease, and the material and odors are trapped inside, cutting down development of bacteria and fungus spores. **770-502-0055; www.paxxo.com**



Longopac Fill continuous bag system from Paxxo

Biosolids Heaters/Dryers/Thickeners

ELODE USA ELECTRO-OSMOSIS DEHYDRATOR

An Electro-Osmosis Dehydrator from ELODE USA can reduce can cut sludge disposal cost by 60% and landfill acceptable by having much drier sludge cake. This compact machine can easily retrofit in line with many existing presses. It uses the electrical potential difference in the sludge cake to separate water in the process and it works on 95% of municipal cakes tested without any chemical, polymer, heat nor mechanical press. It can be used to turn 15 to 20% DS cake to 40 to 45% DS quickly. **201-568-7778; www.elodeusa.com**



Electro-Osmosis Dehydrator from ELODE USA

HYDRO-THERMAL NOH

The NOH, or Non-Obstructing Heater from Hydro-Thermal, has a straight-tube design that allows for unrestricted flow, prevents pressure drop and heats slurries without plugging or fouling. Its rugged design and construction materials enable it to handle viscous slurries, particulate-filled products, abrasive/corrosive substances, stringy products and inline water heating abilities. It utilizes a smaller footprint, with direct installation into the existing system piping, and does not require special tools for maintenance. Utilizing a steam connection larger than the process connection, the max diffuser is sized to accommodate the full flow available from the steam piping. It ranges from 2 to 12 inches in size, with volume capabilities to 6,900 gpm. **800-952-0121; www.hydro-thermal.com**



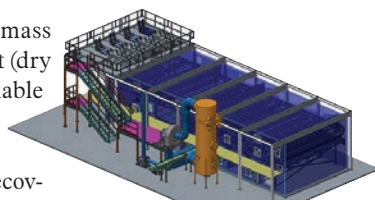
NOH, or Non-Obstructing Heater from Hydro-Thermal

VEOLIA WATER TECHNOLOGIES BIOCON ERS

Rising concern of PFAS contamination of water and soil has sparked interest in this emerging contaminant as it pertains to wastewater sewage sludge. BioCon ERS from Veolia Water Technologies offers a safe and sustainable drying and combustion system for treating PFAS-laden municipal sludge. It combines the efficiencies of a convective air medium-

temperature belt dryer with a biomass furnace, which uses the dryer output (dry product) as a biofuel. The heat available in the exhaust is captured and used as process heat in the belt dryer.

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



BioCon ERS from Veolia Water Technologies

Centrifuges/Separator

PIERALISI CENTRIFUGAL DECANTER

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



Centrifugal decanter from Pieralisi

Chemical/Polymer Feeding Equipment



Tote Bin Scale from Force Flow

FORCE FLOW TOTE BIN SCALE

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

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

LUTZ-JESCO AMERICA LJ-POLYBLEND POLYMER SYSTEM

The LJ-PolyBlend Polymer System from Lutz-JESCO America is a dependable, motorized mixing machine with a corrosion-resistant housing, large turbine and multizone mixing chamber that provides uniform dis-

persion energy at the moment of initial polymer wetting. The prime mixing zone fully activates the polymer, while the second mixing zone promotes gentle polymer activation via a small turbine, lessening molecule fracturing. Its stainless steel injection valve prevents agglomerations and reduces the need for extended mixing time. The system includes a clear mixing chamber that provides visual monitoring of mixing polymer feed.

Its compact design — only 1 to 1.5 square feet — means it's light and allows for easy installation and transportation. It has automatic pump speed adjustment via 4-20mA input, water flow sensor and priming port. **800-554-2762; www.lutzjescoamerica.com**



LJ-PolyBlend Polymer System from Lutz-JESCO America

Composting Equipment

ROTO-MIX 1220-20

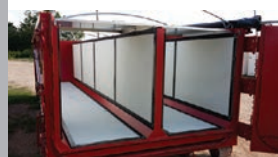
The Roto-Mix 1220-20 horizontal rotary compost mixer has a mixing capacity of 1220 cubic feet and can hold a maximum load of up to 36,000 pounds. It is designed to thoroughly mix materials to ensure rapid decomposition to produce quality compost. This rotary compost mixer, equipped with a GeneRation II Staggered Rotor Mixer, will uniformly blend materials in a tumbling action that does not pack material and helps introduce air into the mix. The rotor lifts the material past the wedging point of the lower side auger, resulting in an aerated mixture while lowering power requirements. Total movement of material in the mixing chamber eliminates dead spots that are common in conventional auger mixers. Optional conveyors allow for the discharge and distribution of mixed nutrients with microorganisms into static compost piles or windrows. It is available in truck or stationary units. This size of mixer works well with large volume composting operations. **620-225-1142; www.rotomix.com**



1220-20 rotary compost mixer from Roto-Mix

Dewatering Equipment

AQUA-ZYME DISPOSAL SYSTEMS ADS



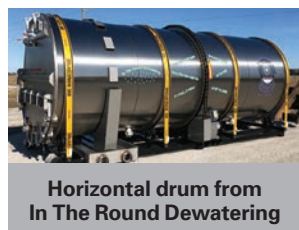
ADS dewatering unit from AQUA-Zyme Disposal Systems

The ADS 30-yard open-top roll-off dewatering unit from AQUA-Zyme Disposal Systems can be filled with 22,000 to 25,000 gallons of biosolids at 1% to 2% solids in about two hours. After draining for 24 hours, the unit can be picked up using a standard-capacity roll-off truck and transported for solids

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

IN THE ROUND DEWATERING HORIZONTAL DRUM

The horizontal biosolids dewatering system from In the Round Dewatering features a stainless steel drum with perforated plastic tile lining. The drum is mounted on a roll-off frame for easy transport and unloading. Trays contain discharge water. An 18,000- to 25,000-gallon batch is mixed with polymer before being filtered in the rotating drum, which is driven by a 1/2 hp variable-speed electric motor with a heavy-duty chain and sprocket. Turning eliminates crusting and wet pockets to produce uniform, consistent results. The dewatered material dumps easily, and the drum is self-cleaning. **317-563-2072; www.itrdewatering.com**



Horizontal drum from In The Round Dewatering

PARK PROCESS SLUDGE KING II

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



Sludge King II dewatering container from Park Process

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

Grinders/Shredders

HYDRA-TECH PUMPS S6SHR

Hydra-Tech Pumps' S6SHR 6-inch hydraulic submersible shredder pump is designed to continuously rip and shear solids with a 360-degree shredding action. The pump's carbide-tipped impeller and hardened macerator suction plate work together to produce a violent shredding action that keeps the path of flow open. This 6-inch pump is suitable for municipal, industrial, agricultural and institutional waste applications. Combined with the HT35 to HT75 power units, it is capable of flows up to 1,000 gpm. The safe and variable-speed hydraulic drive can be used where electric power is hazardous or impractical. **570-645-3779; www.hydra-tech.com**



S6SHR shredder pump from Hydra-Tech Pumps

VAUGHAN SELF-PRIMING CHOPPER PUMP

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



Chopper pumps from Vaughan

Grit Handling/Removal/Hauling

SMITH & LOVELESS PISTA STAINLESS STEEL GRIT CHAMBER

The PISTA Stainless Steel Grit Chamber from Smith & Loveless is designed to offer reliable and long-lasting grit removal performance that is easy to install and can be inserted into existing tankage without the need for new concrete work, including for retrofitting aerated grit chambers. It is constructed of high-quality 316 stainless steel that is corrosion-resistant and designed to provide 50 years of paint, rust and maintenance-free service. The prefabricated system is significantly easier and more cost-effective to install for most sites than typical concrete chambers. Contracting costs are reduced or eliminated altogether, while system downtime and bypass pumping or dewatering needs are reduced. Because it is built exactly to specification, each system is guaranteed to perform exactly as designed and contractor issues are eliminated. Internals are similarly constructed of 316 S.S., including the flow control baffle that provides 95% grit removal down to 100 microns. **800-898-9122; www.smithandloveless.com**



PISTA Stainless Steel Grit Chamber from Smith & Loveless



Raptor Septage Acceptance Plant from Lakeside Equipment

Septage Receiving Stations

LAKESIDE EQUIPMENT RAPTOR SEPTAGE ACCEPTANCE PLANT

Remove debris and inorganic solids from septage tanks, grease traps, sludge, leachate and industrial waste with the fully automated Raptor Septage Acceptance Plant from Lakeside Equipment. It includes the Raptor Fine Screen, which compacts and dewateres the captured screenings to a solids content of 40%. The screen's rotating rake teeth fully penetrate the cylindrical screen bars, which prevents plugging and blinding from grease and small debris. This allows for faster unloading times. The Raptor Acceptance Control System is a security access station that can be integrated with the SAP to allow authorized haulers to unload their waste at the facility. Adding the data management and accounting system with the RACS station provides capabilities to track and invoice customers. **630-837-5640; www.lakeside-equipment.com**

SCREENCO SYSTEMS TRASH MASTER 400 AUTO SCREEN

The Trash Master 400 Auto Screen from Screenco Systems uses gravity to separate the trash from the flow stream through a 4-inch inlet with a fan spreader to power-offload vacuum trucks. It has an aluminum hopper with a 6-inch outlet cam and 3/8-inch gapped 1/4-inch bar screen that meets U.S. EPA 503 regulations. A stainless steel U-channel with plastic-lined titanium UHMW provides for years of wear, with a high-strength alloy steel 8 1/2-inch shaftless screw that moves trash to a waste container. The stainless steel U-channel has slotted drain holes and a center channel bar screen for cleaner and dryer trash. A custom-built stainless steel bar rake is included for easy maintenance. A front spray bar with a 1 gpm nozzle keeps the unit clean and free of buildup. A 2 hp NORD gear reduction drive with Lenze variable-frequency drive control accomplishes a variable-speed screw from 6 to 30 rpm. **208-790-8770; www.screencosystems.com**



Trash Master 400 Auto Screen from Screenco Systems

Screening Systems

FEDERAL SCREEN PRODUCTS MBBR SCREENS

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



MBBR Screens from Federal Screen Products

JWC ENVIRONMENTAL XE SCREENINGS WASHER MONSTER

The JWC Environmental XE Screenings Washer Monster is a fully automated grinding, washing and compacting system. It can handle the first flush loading associated with storm flows. It is finely tuned to optimize the cleanliness and dryness of screenings based on the feed rate; reducing the volume of screenings that must be hauled away. It pre-conditions screenings with a Muffin Monster two-shafted grinder that breaks open rags, plastics and trash to promote washing and removal of soft organics. Liquefied organics return to the plant flow and allow it to achieve cleaner screenings. It has numerous control parameters for programmable wash cycles and a triple-zone spray wash for ultimate cleaning. Its dual-helix auger includes a brush attachment that keeps the screen clean and eliminates material catch points. **800-331-2277; www.jwce.com**



XE Screenings Washer Monster from JWC Environmental

OVIVO USA OZZY CUP SCREEN

The Ozzy Cup Screen from Ovivo USA was designed to replace in-channel screen systems with a rectangular channel or for new greenfield projects. It is placed into the channel with the center shaft perpendicular to the flow supported by two heavy-duty self-aligning bearings on each side of the channel top. An S-plate or diverter plate is installed to split the channel into two sections parallel to the direction of flow. Since it is a single weldment there is only one moving part and O&M costs are dramatically reduced. All maintenance points are done at deck, so there is no reason to go into the channel. It can provide 90 to 98% capture ratios on available apertures and hold this performance throughout its life. **801-931-3000; www.ovivowater.com tpo**



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By Craig Mandli

Centrifuges help treatment plant save substantial annual costs

Problem

The Greenway Wastewater Treatment plant in London, Ontario, used belt presses to dewater biosolids. The solids content was such that the plant had to use ancillary fuel to maintain the temperature in the fluidized bed incinerator.

Solution

The plant installed three **Flottweg C7E centrifuge units**. The process operates 95% of the time, and two of the units run at all times. The machines each accommodate 1,200 liters per minute of liquid material, or 1,700 kg per hour of mass flow.



RESULT:

The centrifuges enable the plant to increase the solids content to about 26%, and ancillary fuel is no longer needed, leading to savings of nearly \$700,000 per year. 859-448-2331; www.flottweg.com

Two-stage screening provides low effluent levels and downstream protection

Problem

The Malden Public Service District in Charleston, West Virginia, constructed a new wastewater treatment plant to maximize capacity and help meet tighter discharge requirements. To maximize performance, a high-quality headworks system was needed.

Solution

The district had enjoyed ease-of-use and operator-friendly **Parkson Aqua Guard** screens at the previous facility for over 20 years. For the new facility the staff chose **Aqua Guard self-cleaning screens**. Two **Aqua Guard UltraClean MN units** (15 mm coarse screens) are followed by two **Aqua Guard PF perforated plate screens** (1/4-inch fine screens). Two-stage screening maximizes solids removal. The units run in a series, augmented by two **Aqua WashPress washer-compactors**.



RESULT:

The units effectively remove debris with low maintenance, so that downstream equipment is protected and the treatment process works efficiently. "The overall performance of the screens beat all our expectations," says Josh Jeffrey, general manager. "The ease of use and low maintenance really make for a fine machine." 888-727-5766; www.parkson.com

Press reduces hauling costs for municipality

Problem

The wastewater facility in Haysville, Kansas, treats 650,000 gpd (2 mgd design). Biosolids are aerobically digested. At 1.5% solids the material was costly to haul to farms.

Solution

The plant team installed a **Fournier Rotary Press**, which has multiple modular dewatering channels rotating at 1 rpm on a single shaft. The liquid enters at low feed pressure (5 psi) and drains as it rotates. It is squeezed through a restrictor valve and extruded as 18% solids cake. The four-channel press is expandable to six channels for growth.



RESULT:

"The press processes biosolids right from our holding tank and dewateres it to the highest level possible" says José Aguilar, plant superintendent. "Since startup we haven't had to do anything on it. Its low rotation really translates to reliability and low maintenance." 418-423-4241; www.fournierdewatering.com

City converts biosolids processing to meet the growing needs

Problem

The wastewater treatment plant in Otsego, Minnesota (population 17,000) treats 4 mgd and produced Class B biosolids via aerobic digestion for liquid land application. The plant required an expansion, while residential development limited application sites nearby and prevented expansion of the plant's footprint.

Solution

The city installed dewatering equipment along with the **Schwing Bioset lime stabilization process**. This eliminated the digesters by processing waste activated sludge directly to Class A biosolids. The facility can also operate in a Class B mode, reducing costs when sending material to the landfill in winter. The equipment's small footprint easily fit the existing site.



RESULT:

The plant produces Class A biosolids at a cost comparable to aerobic digestion, but with more flexibility in operation. The process improved solids treatment and reduced the overall plant footprint. 715-247-3433; www.schwingbioset.com



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Treatment plant expands ion exchange system to treat total organic carbon and color

Problem

Palm Beach County needed to address issues with total organic carbon, disinfection byproduct precursors, and color in finished water. An initial installation of a 10 mgd seven-vessel ion exchange system was effective, but the county wanted to add ion exchange capacity for TOC and color removal.

Solution

The initial installation, an **Organix ion exchange system** from **Tonka Water, a Kurita America Brand**, was installed downstream from the lime softening process. Kurita America then helped design a cost-effective addition of 14 vessels and 20 mgd of additional capacity. The system, now 21 vessels with 30 mgd capacity, is one of the nation's largest municipal ion exchange systems. Treatment begins with lime softening, clarification and gravity filtration. The water then flows to the ion exchange system. Lime solids carryover and any solids accumulation from an upset are easily managed with the addition of airwash grids, which break up solids before backwash and regeneration.



System helps eliminate hydrogen sulfide odors at pump station

Problem

High hydrogen sulfide levels at the Forest Hills Pump Station in Pikeville, Kentucky, were creating a nuisance odor and a possible health risk. The station is at a major intersection and across the street from a high school and football stadium. Operators had tried various chemicals and other odor controls with limited success.

Solution

The operators tried a **Phantom odor control system** from **Anue Water Technologies** that uses sidestream wastewater to draw in concentrated oxygen and ozone. The aerated/ozonated stream is delivered back to the wet well through well washing systems, uniformly transferring the oxygen and ozone for FOG and odor/corrosion control.

RESULT:

The hydrogen sulfide levels dropped to 9 ppm after the first day of operation and to zero during the second day. **760-727-2683; www.anuewater.com tpo**



RESULT:

The process has been highly efficient in delivering high quality water. **866-663-7633; www.kuritaamerica.com**



Patterson Manufacturing Davit Cranes

Give your operations a lift with Patterson Davit Cranes, available in ½-ton and 1-ton capacities. The low maintenance, easy-to-assemble design offers adequate reach to accommodate lifting large loads within tight spaces, and a boom that can be adjusted to nearly 45 degrees to allow for clearance over obstructions such as handrails. Built for durability, it comes standard with a hot-dipped galvanized finish and stainless steel hardware to prevent rust and corrosion in wet work environments. Following Patterson's tradition of safety-focused innovation, the davit features a reliable brake to keep loads in position without creeping. For over 160 years Patterson has been a trusted supplier of winches, rigging, fittings and custom products for lifting applications. Patterson Davit Cranes are made in the U.S.A. and deliver on the company's promise of helping businesses run safer, easier and faster. Find out how Patterson can improve employee safety and positively impact your bottom line.

800-322-2018;

www.pattersonmfg.com/davit-cranes



OZ Lifting Dyno-Hoist lever hoist

OZ Lifting Products introduces the first lever hoist with an integrated

product spotlight wastewater

System takes grit removal to miniscule levels

By Craig Mandli

Excessive grit is a costly component of both the water and wastewater treatment processes, clogging systems, reducing efficiencies and causing abrasion damage and wear that often leads to increased cleaning, maintenance and repair. **Smith & Loveless** combats the problem with its next-generation grit chamber innovation, **PISTA INVORSOR**, designed to capture ultra-fine grit particles down to 75-micron particles across all flow conditions.

"Over the last several years, the marketplace seems to be looking for finer and finer grit removal," says Smith & Loveless President Frank Rebori. "Recognizing that some customers really want to push the envelope to 75-micron grit removal, we said 'Let's look at that, and let's step up the challenge.'"

The PISTA INVORSOR combines two advanced particle separation processes — flat floor hydraulic vortex and inclined plate settling — in one chamber to successfully achieve 95% removal of ultra-fine particles as small as 75 microns.

"Why not create and innovate our technology into a system that has no derated efficiencies, enabling nearly full removal of miniscule grit particles at all flow rates?" says William Flores, vice president of municipal Systems for Smith & Loveless. "There is no excessive water requirements, and no downstream grit accumulation."

A key distinguishing factor of this technology is the consistent high removal efficiency attained at all

PISTA INVORSOR from
Smith & Loveless



flow conditions, including low flow, daily flow and peak flow conditions, meaning performance is never derated at peak.

"We really took it to the next level," says Rebori. "We combined the efficiencies of the PISTA flat-floor vortex and combined it with enhanced settling by inclined plates meeting a defined surface overflow rate."

This allows the system to be sized by flow or by a defined cut particle size. Compared to previous fine particle grit removal systems, the INVORSOR delivers lower capital and operational costs, larger capacity in individual units, greater design flexibility for inlet-outlet design options, and a high surface area-to-volume ratio to generate consistent fine grit capture during low flow, daily flow and peak flow conditions — up to 50 mgd in single units, according to Alex Zuzelski, design engineering manager for Smith & Loveless.

"Long term with this product, customers are going to get better capture and more in the dumpster," he says. "That means less downstream, less maintenance, less draining and less headaches."

800-898-9122;

www.smithandloveless.com

dynamometer to the North American market, the Dyno-Hoist. It gives users a real-time reading of the load — in kilograms or pounds — they are applying to the hoist, whether during a lifting or pulling application. An overload alert is triggered at 126%. The hoist is available in 0.75-, 1.5-, 3-, 6- and 9-ton capacity, matching the ranges of the company's industrial and premium (overload protected) lever hoist offerings. Dyno-Hoist's dynamometer fitting can also retrofit to either of the industrial or premium lever hoists. Other features include all-steel construction; steel handle with rubber grip; zinc-plated load chain; forged alloy steel hooks; and fully enclosed gearing. Dyno-Hoist meets or exceeds CE, ASME B30.21, and AS 1418.2

standards. Standard AA batteries offer a runtime of 150 hours, but the product can be plugged into a 115/1/60 outlet. Each hoist is load-tested and arrives with a test certificate, one-year warranty and a free set of latches.

888-617-3579;

www.ozliftingproducts.com



FCI ST80 thermal flowmeter series

The rugged ST80 thermal flowmeter series from Fluid Components

International provides precision air/gas measurement that helps optimize the O3 disinfection process to avoid the use of harsh chlorine chemicals while at the same time reducing meter maintenance requirements to almost zero. With its built-in temperature compensation, the meter offers highly repeatable performance under various process environments. It features accuracy up to plus/minus 1% of reading with plus/minus 0.5% repeatability over variable process temperatures and pressures in line sizes from 2 inches and up. The series is available in either insertion or inline configurations.

800-854-1993;

www.fluidcomponents.com



IDEC PS3V compact metal frame power supplies

IDEC's PS3V Series of metal frame power supplies offer flexible installation options and a wide operating temperature range to ensure they work safely and efficiently in a wide variety of applications. The supplies build upon the previous generation's reputation for reliability and functionality while adding new features like push-in connections for simplified installation. The PS3V Series accepts a wide input voltage range from 85- to 264-volt AC, and it provides an output of 5, 12 and 24 volt DC with capacities ranging from 15 to 150 watts, both depending on the model. Output voltage is user adjustable plus/minus 10%. A robust yet compact metal housing protects the power supply, and it can be mounted in four orientations by direct panel mount or DIN rail bracket.

800-262-4332; www.idec.com



Flomatic Model 408S5 stainless steel ball check valve

Flomatic Valves' Model 408S6 ball check valve is now available in a full 316 stainless steel 8-inch design. The Model 408S6 ball check valves are AIS compliant and designed according to AWWA C508 standard lay lengths. The ball check valves are anti-roping and self-cleaning with no sharp edges or snag points which helps to prevent clogging from nonflushable wipes and other non-degradable sanitary products. The design is virtually maintenance free with features that include a clean-out cover that provides easy access to the inside of the valve without removal of the valve from the pipeline. The Model 408S6 valves also include heavy-duty bosses to accommodate NPT tapings for additional optional components.

800-833-2040;
www.flomatic.com



QED Environmental Systems EZR Tray air stripper

QED Environmental Systems EZR Tray stainless steel sliding air stripper is ideal for removing VOCs from contaminated groundwater and waste streams. The air stripper's exclusive design results in very high removal efficiencies in an easier-to-maintain process unit. It is less prone to fouling and one person can clean it with a simple pressure wash. It is also less intrusive at a site and offers a wide turn-down range. As contaminated groundwater enters through the top of the air stripper, millions of air bubbles are forced by blower pressure up through the perforated trays. This creates a turbulent froth zone with an extremely high air-to-liquid surface area for mass transfer of VOCs from liquid to air.

734-995-2547; www.qedenv.com



NETZSCH Pumps PERIPRO pump

NETZSCH Pumps North America is entering the peristaltic market with the introduction of the PERIPRO pump. It delivers low and large flow rates at a wide range of pressures. The PERIPRO is particularly robust and a powerful pump that can easily handle viscous and abrasive media even at high pressures. The pumps have a long operating life, are easy to use and can enable 30% energy savings as compared to other hose pumps due to its design. There are no valves or mechanical seals, the only wear part is the hose. In addition, the pumps are insensitive to dry running, require 90% less lubricant than other peristaltic pumps and enable an extremely high metering accuracy. Depending on the field of application, the PERIPRO is offered in different versions to optimally cover various customer needs.

610-363-8010;
www.pumps.netzsch.com

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Dewatered Anaerobic Biosolids

www.fkcscrowpress.com (360) 452-9472 mail@fkscrowpress.com



Nidec Motor SynRA synchronous motor

The SynRA from Nidec Motor Corp. is an innovative synchronous motor. When paired with the ID300 Perfectspeed integrated drive, the motor offers one of the highest efficiencies available for today's industrial and commercial pumping and HVAC equipment with ratings at IE 4 and IE 5. The unique design gives the freedom to replace components individually instead of the entire system, leading to a lower cost of maintenance. The product's Smart Technology results in less wear and tear on blower or pump systems by matching application demands with variable speed. The synchronous reluctance rotor with an aluminum cage design is magnet-free, allowing for easy programming and compatibility with existing VFDs.

888-637-7333;
acim.nidec.com/motors/usmotors



ABB KPM KC7 microwave consistency transmitter

ABB has updated its KPM KC7 microwave consistency transmitter portfolio with a larger flow-through sensor to fit process pipes with a diameter of up to 16 inches, giving the choice to measure the total consistency of mixed pulps with a flow-through sensor. The enlarged flow-through model, extending from a previous maximum of 12 inches, expands ABB's market reach to those with wider diameter pipes that previously could only use insertion types, but now can consider both. The larger size, capturing the whole pipe diameter, provides precise, reliable measurements of total consistency regardless of flow rate for superior process control.

800-435-7365; www.abb.com

(continued)



Fluoramics LOX-8 Plumber's Putty

Fluoramics' new LOX-8 Plumber's Putty is engineered to use with acids, plus alkaline and caustic chemicals. The putty is non-hardening, non-flammable and chemical-resistant that will not degrade and leak like other putties. Use it with Orion, Watts and other chemical waste floor drains, cleanouts, sinks and sink drains in laboratories, medical facilities and other places which use aggressive chemicals. LOX-8 Plumber's Putty is easy to apply: simply warm the putty in your hands, roll it into rope-like strands and apply it to clean and dry areas on traps, sinks and drains.

800-922-0075; www.fluoramics.com



Franklin Electric Pioneer Pump ElectricPAK

Franklin Electric brand Pioneer Pump launched the ElectricPAK, a modular offering of electric-driven pump packages that helps users get a pump and motor configuration on site more quickly and efficiently than custom-built units. Each configured assembly includes a high-performance pump and electric motor that provides better flow, higher head and greater efficiency. The robust design also features a rigid motor stool that keeps the pump and motor permanently aligned. This unique feature eliminates the need for time-consuming alignment work or special tools upon delivery or when the unit is moved. The modular system can also be disassembled quickly and simply, for reduced service and maintenance hours.

866-271-2859;

www.franklinengineered.com



Grundfos Vaccuperm dosing line

Grundfos models VGB-103, VGA-111 and VGA-113 Vaccuperm chlorine gas dosing systems are now available in the U.S. market. The dosing systems handle and transport, as well as store the chlorine for water disinfection. Using the vacuum principle allows the system to avoid the risk of gas leakage. They use a vacuum and dosing regulator which establishes use for drinking water, wastewater and industrial water applications.

www.grundfos.us



Infiltrator Plant Selection Tool web app

Infiltrator Water Technologies launched a new web application to simplify the design process for decentralized wastewater treatment plants. The Wastewater Plant Selection Tool translates user input of project parameters like flow rate, influent parameters and effluent requirements. Then, the tool instantly generates preliminary design documents including system drawings of a solution to best match the project needs. This new design tool is available for anyone to use on the Infiltrator website.

800-221-4436;

www.infiltratorwater.com tpo



Prepackaged video system a fit for remote site management

By Craig Mandli

Your wells provide the lifeblood to your community. Clean, fresh, uncompromised water is an expectation for your citizens, and it is up to you as a municipal water treatment manager to provide a steady stream. But as the industry faces an era of labor shortages, it also faces increased safety/security requirements. Now a new system from **Memoreyes Municipal** provides a complete **video system** with cellular communications, a Sentry pre-packaged field device and cloud/web access services for municipal wells and other remote pumping and instrument sites.

The system combines edge computers, high-speed cellular, high-definition cameras and battery-backed power supplies into a small custom industrial enclosure for long service life. It can handle multiple cameras for indoor/outdoor applications. All video, images and data are cloud stored automatically and can be viewed real-time on web displays. All these services, including cell data costs, are combined into one, stable, monthly fee. The company's president, John Collings, has been pioneering cellular/web-based SCADA technology for more than 20 years.

"What was missing was affordable and reliable remote site video," he says. "This system can be completely up and running in less than an hour. This system increases remote site safety with man down alarms as well as being able to see and listen in on demand."

The company drew from its years of experience providing large outdoor video systems designed for apartments and commercial facilities. Doing those jobs required perfecting wireless ethernet for video transmission, combined with unique installation methods to keep installation costs down. Additionally, the company developed wide area sensors to direct the cameras toward human activity, thus reducing camera costs while increasing safety.

"A few years ago, we saw the convergence of technology, price and performance that would allow us to not only provide remote vision systems, but also a myriad of other remote site management tools for the water/wastewater market," says Collings. "Cell cameras are often expensive, don't work reliably in difficult cellular areas, and lead to astronomical monthly cell bills. We've addressed all of that plus wrapped three separate services into one. It works and municipalities can afford it."

The company offers the cell camera/vision system by itself, and it can be expanded to include analog, digital, pump run SCADA I/O delivered to a secured cloud/web display system.

"This is the municipal management tool of the future," says Collings. "We're Zoom for remote assets, and more."

770-989-1776; www.mm4s.net



Video system from Memoreyes Municipal

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happy to see how we are protecting
our community in a tangible way.”

Christen Wood
Operations Administrator
Upper Tuscarawas Wastewater Treatment Plant, Akron, Ohio



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They've been here forever.
They do the work.
I'm support staff.
I coordinate what they do,
and the best way for me
to do that is to listen to
what they have to say."

Nate Tillis
Operations and maintenance supervisor
Beloit (Wis.) Water Pollution Control
Treatment Facility

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MFG Chemical names Todd Viens CFO

MFG Chemical has hired Todd Viens as chief financial officer. In addition to managing the finance functions, Viens will partner with the leadership team in executing MFG Chemical's strategy around safety, revenue growth and operational excellence. He will work from the company's corporate office in Chattanooga, Tennessee.



Todd Viens

Flottweg adds warehouse to Kentucky campus

Flottweg is building a new 15,000-square-foot warehouse at the company's existing campus in Independence, Kentucky. The building is expected to be completed in early 2023, and will allow for additional production and parts storage.

Justin Pecoroni joins Franklin Electric

Franklin Electric welcomed Justin Pecoroni to its industrial and engineered systems business unit. In his new role as senior business unit manager, he will lead all of the commercial activities within the company's OEM business segment, providing technical expertise and setting the strategic vision to support the needs and growth of Franklin Electric's customers. Pecoroni brings more than 10 years' experience serving industrial clients to the role. In his previous position as global account manager for Wesco-Anixter, he worked closely with clients in the renewable energy space, developing and managing teams in direct support of critical infrastructure projects. He also worked on supply chain integration projects to address complex customer needs.



Justin Pecoroni

WQA launches rebate program, names new president

Water Quality Association members who earn a professional certification title within a year of starting WQA's professional training program could be eligible for a rebate under an initiative announced at the 2022 WQA Convention and Exposition. The rebate, available for a limited time to Core and Premier level dealer members, would cover most online training costs and a certification exam.

WQA also announced that Jim Stern, executive vice president for A. O. Smith Corp., is the association's new president. Stern outlined the three strategic goals of WQA's 2022-24 strategic plan, which are: advancing knowledge and professionalism of industry participants; increasing advocacy; and driving public awareness and knowledge.



Jim Stern

Atlas Copco launches Your Silent Partner campaign

Atlas Copco Portable Air has launched a communications campaign promoting the benefits of its E-Air electric compressor range. The Your Silent Partner campaign stresses the benefits that electrification brings with it, including a large reduction in noise output. The wider communication campaign aims to boost sustainability and help jobs be completed in a more user-friendly way.

Ansell Sims joins Hydraulic Institute board

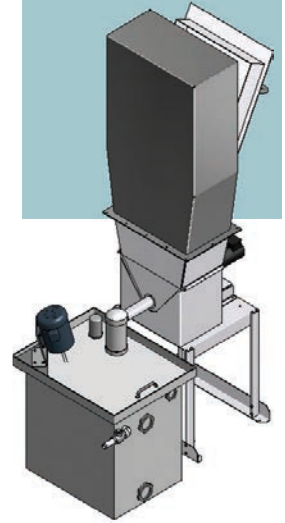
Grundfos Americas President Ansell Sims joined the Hydraulic Institute's board of directors. He will serve three years on the board starting immediately. The institute sets industry standards through the publication of many different materials, such as application guidebooks and online tools.

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North Texas to improve water treatment

The North Texas Municipal Water District is upgrading its Wilson Creek Regional Wastewater Treatment Plant to prepare for population growth and preserve environmental stewardship. Upgrades at the 64 million-gallons-per-day facility will improve reliability, optimize process performance and energy efficiency and increase flexibility. The design and engineering of the upgrades is being led by Brown and Caldwell.

Stantec announces new water leadership team

Stantec announced a new leadership team for its water business led by Ryan Roberts. All members of the water leadership team are long-term Stantec employees and have held multiple leadership roles throughout the firm's water business. The four key leaders supporting Roberts are: Matt Travers, water business operations leader; John Montgomery, director of water strategic growth; Kari Shively, director of water marketing, business development and sales; and Joe Uglevich, director of water project delivery.

Seven Seas Water Group adds Nadine Leslie to its board

Seven Seas Water Group announced the addition of Nadine Leslie to its board of directors. Leslie brings more than 25 years of industry experience in operations, management, compliance, stakeholder relations and due diligence. She most recently served as CEO of Suez North America, following prior leadership positions within the company's regulated, contract and corporate segments. Leslie also previously served as Suez Group executive vice president, health, safety and security and was involved in various corporate social responsibility initiatives.



Nadine Leslie

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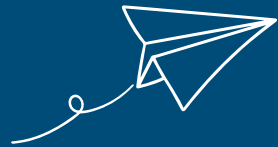
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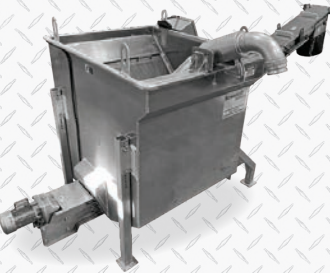


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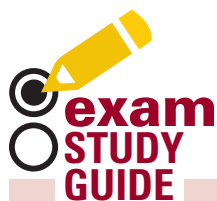
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WASTEWATER

By Rick Lallish

What condition may occur if old packing is not removed completely, before repacking a pump?

- A. Tension-alignment problems
- B. Shaft scoring
- C. Excessive leaking from the magnetic seal
- D. Packing gland misalignment

ANSWER: B. When changing the packing on a pump, it is imperative to remove all the old packing before installing new packing. If this is not done, shaft scoring will occur, leading to premature pump failure and leakage. Proper pump packing is vital for proper pump operation and maintenance. Replacing a shaft or pump can be costly. More information may be found in the *Pumps and Pumping* textbook from Skeet Arasmith, 9th edition, 2006.

DRINKING WATER

By Drew Hoelscher

What mA signal should an operator expect if a chemical feed pump is operating at 75% flow capacity on a 4-20 mA current loop?

- A. 4
- B. 8
- C. 16
- D. 20

ANSWER: C. The 4-20 mA point-to-point or multipoint circuit is commonly used in the automation of process equipment at water treatment facilities. Using the mA signal transmitted from instruments and sensors to a controller is a crucial step in troubleshooting process equipment. For example, a 4 mA signal would indicate a chemical feed pump that is not operating and a 20 mA signal would indicate a chemical feed pump operating at 100% capacity.

ABOUT THE AUTHORS

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

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The **Southwest Water Reclamation Plant** in Cape Coral won its third consecutive Outstanding Wastewater Treatment Performance Award from the Florida Environment Association.

The **Rapid City** wastewater treatment system received the 2021 Operation and Maintenance Wastewater Treatment Award from the South Dakota Department of Agriculture and Natural Resources.

Allentown received a Project of the Year award from the American Society of Civil Engineers/New Jersey Section for its wastewater treatment plant upgrade.

The **Washington County Service Authority** won its 12th consecutive Gold Award in operations and performance excellence from the Virginia Department of Health Office of Drinking Water.

The Advanced Purified Water Demonstration Project by **OneWater Nevada**, conducted at the Reno-Stead Water Reclamation Facility was named 2021 Project of the Year by the Truckee Meadows American Society of Civil Engineers.

Tom Martin, water and wastewater manager for the Clallam County Public Utility District, received the Grace Under Pressure award from the state of Washington. Martin led the successful effort to work with retailers, the state National Guard and volunteer pilots to deliver water to customers after a November landslide broke a water pipeline and damaged the Hoko pumping station, cutting off drinking water to Sekiu and Clallam Bay customers. The district then built a bypass line to help restore service until the highway could be cleared and repairs made.

St. Tammany Parish Government & Pontchartrain Conservancy received the Gulf Guardian Award from the U.S. EPA Gulf of Mexico Division for its Home System Inspections project to improve beaches, marine resources and water quality in the Gulf of Mexico.

The **Sonoma County Water Agency** received the first Excellence in Innovation Award from the Association of California Water Agencies for its Forecast-Informed Reservoir Operations.

Johnson County, Kansas, celebrated completion of the **Tomahawk Creek Wastewater Treatment Facility**, which facility serves about 150,000 residents.

Richard Knowlton retired as Maine Water Co. president after 29 years with the utility. He was succeeded by **Mark Vannoy**.

Susan Rungren, general manager of Ventura Water in California, retired in June after 23 years with the utility.

Richard “Dick” Constantine retired after 36 years with the Hudson (Massachusetts) Department of Public Works. A Hudson native, he was the maintenance chief of the wastewater department.

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AWWA Transformative Issues Symposium: Embracing Our Differences, Hilton Cincinnati Plaza, Ohio. Visit www.awwa.org.

Aug. 10

AWWA Water main Condition Assessment webinar. Visit www.awwa.org.

Aug. 17

AWWA Innovative Thinking: using Public-Private Partnerships in Developing Affordability Programs webinar. Visit www.awwa.org.

Aug. 24

AWWA Managing Iron and Manganese in Small Systems – New Insights on an Old Problem webinar. Visit www.awwa.org.

Aug. 30-Sept. 2

Chesapeake AWWA Section Annual Conference, Roland E. Powell Convention Center, Ocean City, Maryland. Visit www.csawwa.org.

Aug. 30-Sept. 1

Kansas AWWA Section Annual Conference, Hotel Topeka/Stormont Vail Events Center. Visit www.ksawwa.org.

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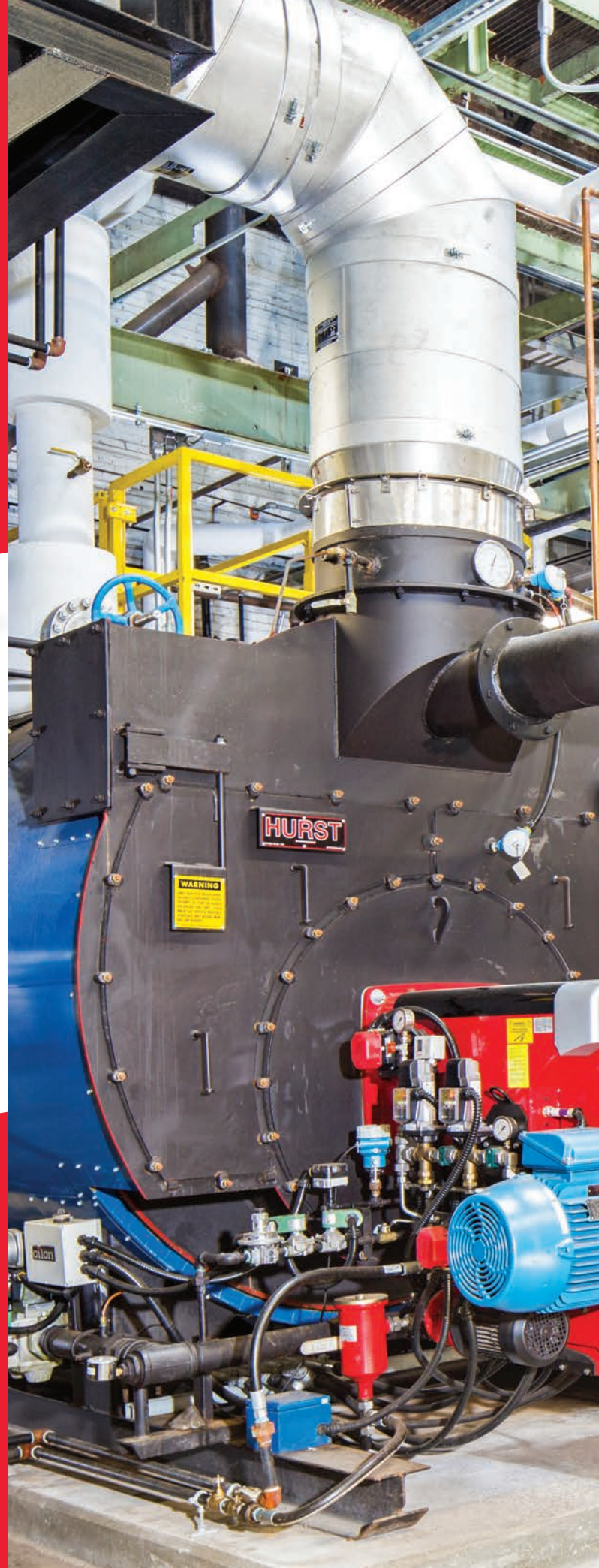


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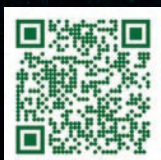
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