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Scott Millholland
Wastewater Treatment Supervisor
Gardner, Kan.



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on the cover

Without a permit violation in more than 10 years, the Kill Creek treatment plant in Gardner was the Kansas Water Environment Association Plant of the Year in 2004, 2005, 2007 and 2012. And in three of those years, the team led by Scott Millholland, wastewater treatment supervisor, also won the KWEA's Safety Award. (Photography by Steve Puppe)

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- Top Performer – Plant: Planning for growth in Courtland, Va.
- Top Performer – Plant: Membrane filtration in Harrison Hot Springs, British Columbia
- How We Do It: Ammonia measurement in Loveland, Colo.
- Greening the Plant: Aeration and biosolids improvements in New Ulm, Minn.
- Lab Detective: Connects between drinking water and wastewater
- Hearts and Minds: Plant tours by bicycle in San Francisco, Calif.
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let's be clear

Message Getting Through?

THERE'S GROWING RECOGNITION THAT NONDISPERSIBLE WIPES ARE A PROBLEM. AND THERE'S A GROWING BASE OF INFORMATION TO HELP CLEAN-WATER AGENCIES COMMUNICATE SOLUTIONS.

By Ted J. Rulseh, Editor

The message about the harmful nature of some disposable wipes seems to be making its way into the mainstream. It's reaching from the treatment plant and collection system workers who have to deal with the problems, to trade magazines like this one, all the way into general-interest newspapers.

Earlier this year, a *Milwaukee Journal Sentinel* columnist wrote about wipes plaguing the sewer system in a suburban community. A similar article appeared in the *Times Herald-Record* newspaper in Middletown, N.Y. These are signs that information is starting to reach the people who need it most, which is to say everyday citizens.

Not every clean-water agency has issues with wipes, but if your agency is among those that do, you may not need to reinvent the wheel when it comes to public information. There's more already available

than you may think — it's effective, and some of it is downright entertaining.

SING ABOUT IT

Falling into the entertaining category is a song, "Don't Flush the Baby (Wipes)," by Steve Anderson, water resources analyst with Clean Water Services in Oregon. Though he would likely deny it, his voice bears a resemblance to Neil Young's. Some lyrics:

*Young mother changing diapers on her newborn
She grabs a moist towelette to cleanse his skin
With baby changed she walks up to the toilet
The towelette in her hand she tosses in
She doesn't know the baby wipe's a tough one
And it can make a clog in sewer pipes*

You'll find this and various other items on the National Association of Clean Water Agencies (NACWA) website at www.nacwa.org/flushables. Another clever little item there is a "Smart Flush Bunny" poster — the bunny of course knows the only thing it's safe to flush is toilet paper.



THE FIRE CHIEF PROJECT: Idea of the Month

So much of how a clean-water agency is perceived lies in how it describes itself. Here are three descriptions from agencies as listed on their websites:

Typical: *"Any City's wastewater treatment plant uses physical, biological and chemical systems to treat wastewater. Wastewater is screened prior to pumping to the grit removal facility ..."* This is how a great many treatment plants introduce themselves to the public. It's all accurate; it's all true; but it doesn't get at the core mission of the plant or agency.

Better: *"The mission of NEW Water is to promote public health and welfare through the collection, treatment, and reclamation of wastewater, while assessing stable, competitive rates ..."* This is from the entity that used to be known as the Green Bay (Wis.) Metropolitan Sewerage District. Notice the emphasis on public benefits instead of the technical process.

Much better: *"Clean Water Services is a water resources management utility committed to protecting water resources in the Tualatin River Watershed. More than 536,000 customers enjoy clean water and healthy rivers and streams ..."* Clean Water Services is based in Hillsboro, Ore. This description covers all the positive things the agency and its clean-water plants do.

How do you describe your agency and treatment plants to the public? Does your description emphasize your end products?

Remember the aims of **The Fire Chief Project**:

- Raise clean-water operators to the stature of the fire chief
- Make young people grow up wanting to be clean-water operators.

Visit The Fire Chief Project blog at www.tpomag.com

Send ideas for The Fire Chief Project to editor@tpomag.com

The agency that got my attention about this issue, the Portland (Maine) Water District, has its own approach in a mascot called Stopper the Unflushable — he's a cylindrical plastic wipes container with arms, legs and a crooked smile. There's also a 5-minute public service announcement video created for the district by students at the University of Southern Maine.

HARD EVIDENCE

There are all sorts of more prosaic materials on the NACWA site — links to Web pages, newsletters, videos, reports and studies, and seminar presentations. You could look no farther than this site and accumulate quite a bit of information and an arsenal of ideas for your own communication programs.

If you want a dramatic display of what "flushable" does and doesn't mean, there's a "Will It Flush?" video created by the City of Spokane (Wash.) Department of Wastewater Management. It demonstrates the relative dispersibility of various products, including regular and plush toilet paper and facial tissues.

Not every clean-water agency has issues with wipes, but if your agency is among those that do, you may not need to reinvent the wheel when it comes to public information.

Each item is placed in a separate glass container stirred by an electrically powered propeller. The toilet papers break apart quickly (although the plush version takes a lot longer). The wipes do not — and, for that matter, neither do the single-ply and triple-ply facial tissues.

Also tested are feminine hygiene products, cotton swabs, and dental floss (which promptly winds around the propeller shaft, showing how it would behave in contact with wastewater treatment equipment). Getting this video in front of consumers could likely do a great deal to get them to revisit their habits.

The moral of the story, according to the video narrator: "The only things that should ever be flushed down the toilet are human waste

and toilet paper. Anything else can cause backups in the system and headaches for you."

And the moral of a larger story is: If you need to inform your public about the hazards of wipes and what not to flush, much of your work is already done. Most likely, agencies with materials on the NACWA site would be more than happy to share them. **tpo**

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THE TEAM IN GRANDVIEW, WASH., CATERS TO A LARGE FOOD PROCESSING INDUSTRY, WHILE A FLEXIBLE PROCESS HELPS THE PLANT CONTRIBUTE TO WILDLIFE HABITAT ENRICHMENT

By Jim Force

HOW DO A NUMBER OF LARGE FOOD PROCESSING plants and a sensitive waterfowl habitat co-exist in a relatively small agricultural community? In Grandview, Wash., the key is the municipal wastewater treatment facility.

Treatment system supervisor David Lorenz and his team run a versatile process capable of handling the high-solids wastewater from the food industry, while recycling treated water to nearby Washington State Wildlife Department lands used by migrating ducks and geese. Biosolids from the plant are applied to area farms.

Normally, Grandview uses an oxidation ditch system to treat an average of 1.5 mgd from this central Yakima Valley community. But the facility also relies on an old lagoon system to gain extra capacity and store wastewater, and to supply water to the state lands in late winter while algae growth is dormant and before the new bird hatch commences.

Lorenz, who once farmed in the area before entering the clean-water profession 25 years ago, likes the flexibility of his operation and the positive impact it has on the local ecosystem. He's also proud of the facility's industrial pretreatment program, which helps area businesses handle high solids discharges and sustain production and is heralded as one of the best in the state.

"Our process is really interesting and exciting, especially storing water and using it to enhance water quality on the state game land," he says. "The whole facility here is really unique."

FOLLOWING THE FLOW

Wastewater from residential and industrial customers moves through the sewer system to a lift station on the north bank of the Yakima River, the plant's receiving stream. From there, it is pumped under the river to the south side, and then another mile to the treatment facility.



An aerial view shows the plant's secondary clarifiers and the WAS/RAS and UV disinfection building. A portion of a 100,000-square-foot biosolids drying bed is visible. The clarifiers contain 320,000 gallons each. (Photography by Mark Roberts)

In the headworks, the flow is raised by the primary lift stations, then sampled and measured with a Magmeter flowmeter (Toshiba). The wastewater passes through a fine screen equipped with a Muffin Monster grinder and auger (JWC Environmental). Screenings are collected and taken to an area landfill.

An 80-foot-diameter clarifier is available as a bypass in case the headworks is taken offline for maintenance. Next, the alternative treatment patterns at Grandview kick in. In the most common scenario, wastewater moves from the headworks to a 500,000-gallon primary clarifier, then through a splitter box to a lift station that feeds four 230,000-gallon anoxic treatment tanks that promote phosphate removal.

After anoxic treatment, the flow is directed to a straight-ditch activated sludge system (designed by the late Larry Esvelt, a Spokane engineer). The system consists of two ditches, each powered by two rotor aerators designed to operate at 100 hp. Treated wastewater then settles in a pair of circular sec-

"I'd rather have my operators in the field recording instrument values than in a control room removed from the process."

DAVID LORENZ

ondary clarifiers with mechanical brush systems that clean the sides, bottom and weirs. Lorenz reports that his team runs the ditch-clarifier systems in parallel, with a solids residence time (SRT) of 10 to 12 days in summer and as long as 18 days in winter.

A UV system (UltraTech Systems Inc.) with four chambers and 160 lights disinfects the effluent, which then passes through a Parshall flume. Some water discharges to the Yakima, while another portion is returned to the

Operator Rey Rodriguez inspects the consistency and firmness of biosolids cake. The Grandview facility generates up to 1,800 dry tons annually. (Belt filter press from Andritz.)



profile City of Grandview (Wash.) Wastewater Treatment Facility

BUILT:	2002
POPULATION SERVED:	10,000
FLows:	4.2 mgd design, 1.5 mgd average
TREATMENT LEVEL:	Secondary
TREATMENT PROCESS:	Activated sludge
RECEIVING WATER:	Yakima River (also irrigation of state wildlife department lands)
BIOSOLIDS:	Dewatered, land applied (Class B)
AWARDS:	Washington Department of Ecology Outstanding Wastewater Treatment Plant, 2003, 2006, 2011
ANNUAL BUDGET:	\$3.22 million
WEBSITE:	www.grandview.wa.us
GPS COORDINATES:	Latitude: 46°12'47.58" N; Longitude: 119°54'36.39" W



facility for various uses, including hosing and rinsing the belt press, and operation of the heat pumps in the laboratory-office building.

Grandview does not yet have a SCADA system — the team uses traditional hands-on techniques to control operations. Observes Lorenz, "I'd rather have my operators in the field recording instrument values than in a



Operators Kim Endicott, left, and Nick Suarez inspect and clean the UV disinfection system (UltraTech Systems Inc.).

control room removed from the process." Those operators are Rick Revard, Nick Suarez, Jeff Cochrane, Kim Endicott and Ray Rodriguez.

BIG ON BIOSOLIDS

In accepting a large volume of food processing wastewater, the Grandview facility produces a large amount of biosolids. That's good news to area farmers who grow wheat, corn and hops: the more biosolids, the more material to augment their soil and increase crop production.

In the treatment process, waste activated sludge from the secondary clarifiers is pumped to a holding tank and then to a belt filter press (Andritz) after polymer addition. The press yields a cake containing 17 to 18 percent solids.

After dewatering, the biosolids material travels on a serpentine belt to a truck, which transports it to a staging area where it is held for about a year. Then the solids are moved to a 177,000-square-foot asphalt drying bed area on the plant grounds. There, the biosolids are spread about an inch thick to dry out to about 95 percent solids. The process achieves about a 40 percent reduction in volatile solids and near-complete pathogen reduction.

"It's classified as a Class B biosolids," Lorenz says. A private firm — Natural Selection Farms — hauls it to farms, where it is incorporated into the soil. Some is used to grow corn near the plant to feed deer and other wildlife. "We have a lot of wildlife around the facility — coyotes, bobcats, pheasants, maybe some elk," says Lorenz. "It's almost like a private game preserve."

(continued)



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WORKING WITH INDUSTRY

While Grandview is small in population, it's pretty big when you consider its industrial base. Located in the state's fruit and vegetable belt, Grandview is home to large food processing facilities like Welch's, Foodsmart, Smuckers, and the Chateau Ste. Michelle winery. The Japanese company Shonan USA is also here.

Food processing plants use a lot of water and discharge a wastewater high in suspended solids and BOD. "We only have a population of around 10,000," says David Lorenz, treatment system supervisor. "But with our industrial growth, the treatment facility handles a wastewater that is typical of a population of more than 15,000, and the biosolids load of a community of 100,000."

While such flows could present problems for some treatment plants, that's not the case in Grandview. Lorenz and his staff work closely with the industries to make sure they stay in compliance

with the city's pretreatment program and that their sampling and monitoring equipment is functioning according to plan.

"Before 1995, the plants just bought water from us and sent wastewater back," Lorenz recalls. "Now, we monitor and collect industrial discharge samples at eight monitoring stations, check flowmeters and equipment, bring their samples back to the lab and run their BODs and solids, and track pH minute-by-minute."

The food processing plants use the data to file their required environmental reports to the state. They also pay the treatment plant based on loadings — so much for thousand gallons discharged, and pounds of solids and BOD. It's a symbiotic relationship that sustains the important economic activity in the area and produces revenue for the treatment facility: "We used that money to retire the debt on our 2002 expansion," Lorenz says.

DIFFERENT APPROACH

While at many treatment plants the process would end there, it doesn't at Grandview. Old lagoons, built back in the 1970s when they provided all the treatment, give the facility extra capacity for storage and more options for discharge. They're like having more in the cupboard, as it were. "It's what we call a directional flow pattern," says Lorenz. "There are 27 lagoons, about 200 acres in all. Some are aerated, some not."

Any wastewater not treated in the biological system simply overflows into

"Our process is really interesting and exciting, especially storing water and using it to enhance water quality on the state game land. The whole facility here is really unique."

DAVID LORENZ

The Grandview team includes, from left, Rick Rivard, Rey Rodriguez and Kim Endicott, operators; David Lorenz, treatment system supervisor; and Nick Suarez and Jeff Cochran, operators.

the lagoons, which can store primary-treated wastewater until periods — such as at night — when flow through the plant is reduced. Then, the stored water can be fed into the biological system for full treatment.

Or — and this is what really gets Lorenz talking and no doubt contributed to the number of awards his plant has received from the Washington State Department of Ecology — the lagoon water can be brought back into the system, disinfected, and sent some four miles to the state wildlife area.

"From the middle of February through the end of March, we pump the water to the state lands — about 50 million to 80 million gallons a year," Lorenz says. The state land encompasses about 2,500 acres and is a prime site for migrating geese and ducks on their annual treks up and down the Pacific Flyway.

"This is the time when the algae dies off," explains Lorenz. "It's about a 30-day window. We supply treated

(continued)



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Nick Suarez turns biosolids on asphalt drying beds. Grandview uses 177,000 square feet of drying beds to condition its biosolids, and an additional 150,000 square feet are still to be asphalted.

City of Grandview Wastewater Treatment Facility PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT
BOD	1,018 mg/L	4 mg/L	30 mg/LI
TSS	485 mg/L	6 mg/L	30 mg/L

"We have a lot of wildlife around the facility — coyotes, bobcats, pheasants, maybe some elk. It's almost like a private game preserve."

DAVID LORENZ

water, and the state wildlife area lagoons fill to capacity and are ready when the waterfowl return in the spring."

There are up to 10,000 hatches of waterfowl on the state land during that period. The water greatly benefits the state lands, according to Robby Sak, assistant manager of the Sunnyside Wildlife Area. "The water is pumped through HDPE pipe into our Byron Unit," he explains. "Byron is a little like a moonscape, with salt rock outcroppings and little craters. The water fills the craters, forming small ponds that became nesting areas for waterfowl. If the weather's right, the water will stay in the ponds until summer. Without that source, we'd be dependent upon the small amount of natural water available to us."

Adds Lorenz, "Overall, we send more discharge to the river than to the wildlife area." But he and his staff take pleasure in achieving something beyond treating and discharging wastewater. "While we're limited as to what we can send them, we like sending water to the state land," he says. He and his operators can directly witness the benefits of treatment efforts and, more important, "it lets Mother Nature take her course." **tpo**

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Learning Lasts All Year

A KIDS' CALENDAR HELPS THE OAKLAND COUNTY WATER RESOURCES COMMISSIONER'S OFFICE GET STUDENTS INTERESTED IN KEEPING WATER CLEAN

By Briana Jones

Getting young people involved is easy for the Oakland County (Mich.) Water Resources Commissioner's Office (WRC). The agency just asked kids to draw pictures related to clean water. "Usually the really funny ones have to do with poop for some reason," says Jacy Garrison, environmental planner II.

First printed in 2006, the Kids' Clean Water Calendar features drawings representing each month. There were 125 entries the first year, and now more than 1,000 come in annually.

"We send solicitations to fourth and fifth graders because it's the time in the curriculum when kids are introduced to the water cycle and water quality," says Garrison. Teachers collect the drawings and submit them for judging in fall.

GET CREATIVE

Themes for the drawings include cleaning up after pets, ways to conserve water, disposing of household hazardous waste properly, and keeping pollution out waterways. All topics relate to water quality and the importance of keeping water clean for everyone.

The WRC operates and maintains the Commerce Township Wastewater Treatment Plant (8.5 mgd design) and operates, maintains and owns the Walled Lake-Novu Wastewater Treatment Plant (3.5 mgd design).

To date, operators have not helped with the calendar judging, but they "could be involved if they wanted to be," says Charles "Chip" Tischler, WRC community liaison. "The more the merrier."

With 12 winners each year — one for each month — it can take quite a while to sort through the entries. "Jacy and I sit in a room for hours on end and funnel through all the submissions, then get down to a core group and send them out to judges," says Tischler.

"Say we get in 1,200 drawings. We'll whittle that down to 100, 200, 300 depending on how many great ones there are, and then we have a panel of judges. They'll do the final judging and the ranking. That's how we get it down to our 12 winners, honorable mentions and special acknowledgements." Judges include office personnel, local environmental professionals and project partners.

AWARDING ARTISTS

Along with the main drawing for each month's calendar, one honorable mention and two special acknowledgement drawings are chosen and displayed at the page bottoms. "This way we can recognize some of the really good entries that weren't able to be winners," says Garrison.

Water Resources Commissioner John P. McCulloch with the 2012 calendar winners.



PHOTOS/GRAPHIC COURTESY OF THE OAKLAND COUNTY WATER RESOURCES COMMISSIONER'S OFFICE

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In December, winners take part in an awards ceremony at the Cranbrook Institute of Science, Michigan's Museum of Natural History. "Water Resources Commissioner John P. McCulloch presents each winner with a plaque of his or her drawing, and they get an annual membership to Cranbrook," says Garrison.

A major funding mechanism for the calendar is a nonprofit called Great Lakes Guardians. "It provides the funding for the printing and the awards ceremony, along with a number of other sponsorships and partners from companies across Oakland County and southeast Michigan," Tischer says.

The funding jump-started the drawing contest, but the students' enthusiasm about the importance of water quality keeps it going and growing. "It's a thrill for me to be part of the Kid's Clean Water Calendar Contest," says McCulloch.

"The sense of achievement that our 12 winners have, along with the environmental lessons learned by them and the more than 1,000 participants, is invaluable. Since 2005, this program has helped educate thousands of young people on the impact they have on the environment." **tpo**

Kevin Larsen, left, chief deputy water resources commissioner, with 2012 grand prize winner Chyanne Kuptz and McCulloch.



McCulloch addresses the winners and their families at the awards ceremony for the 2012 calendar contest at the Cranbrook Institute of Science.

"Since 2005, this program has helped educate thousands of young people on the impact they have on the environment."

JOHN P. McCULLOCH

What's Your Story?

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



An informational sign at the Holly Advanced Tertiary Treatment Plant marks a stopping point and rest area for canoeists and kayakers.



PHOTOS COURTESY OF THE HOLLY ADVANCED TERTIARY TREATMENT PLANT

Bye-Bye Bad Old Days

A RIVERFRONT SIGN TELLS PADDLERS PASSING THE HOLLY ADVANCED TERTIARY TREATMENT PLANT ABOUT REMARKABLE PROGRESS IN POLLUTION CONTROL

By Jeff Smith

A 3- by 4-foot sign on the bank of the Shiawassee River in southeast Michigan tells the success story of the wastewater treatment plant in the Village of Holly. Positioned within 10 feet of the plant perimeter fence and with the plant in full view behind it, the sign marks a designated stopping point and rest area for canoeists and kayakers.

"The sign is located right at our outfall," says Tim Stallcup, plant superintendent. "Everyone who stops can see the plant and see how clear our water is before it goes into the river. They can see everything."

Donated by Headwaters Trails, a local non-profit group committed to building a network of hiking and waterway trails, the sign displays digital images embedded in a fiberglass surface that contrast discharge water conditions before and after enactment of the 1972 Clean Water Act.

Featured are the Holly Advanced Tertiary Treatment Plant of today (1.35 mgd design, 0.9 mgd average) and a list of its many awards from the state and the U.S. EPA. The sign also lists consumer tips for improving water quality and displays an image of a discharge pipe whose polluted discharge transforms into a clear waterway with fish.

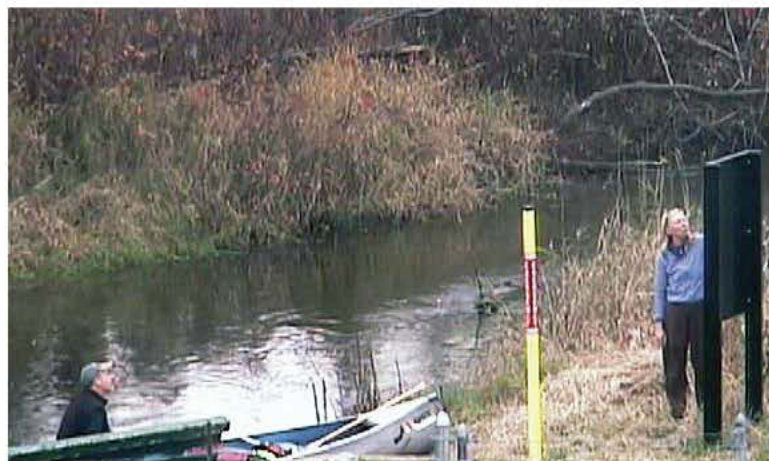
The sign's caption reads, "The Bad Old Days Are Gone," and a sub-caption reads, "How far we have come ... by cleaning up our act."

"It's not meant to be negative," says Headwaters Trails president Sue Julian. "We just wanted passers-by to get the message on the sign, even if they didn't stop. There are never any odors at the plant, and there are always lots of fish, so we don't have to say how good it is – that speaks for itself."

Plant operators helped install the sign, mounted on two aluminum posts cemented into the ground. Water at high levels from spring flooding reaches

the support posts but has had no effect on the sign since its installation four years ago, Stallcup says.

Although no one has ever tried to deface the sign, graffiti could easily be removed from the fiberglass surface. Fading and fogging have not happened, either. A plant security camera aimed at the sign and the river often reveals the surprise of canoeists and kayakers who stop and witness the cleanliness of the water and the plant, says Stallcup.



Canoeists stop to read the sign comparing current treatment to the "old days."

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Sometimes during organized canoeing or kayaking events, plant staff members post pictures of the river users on the plant's website, further promoting the commitment to clean water. "It's kind of a good PR effort and people can better understand our treatment process," Stallcup says.

A grant from the Saginaw Bay Watershed Initiative Network helped fund the sign, which was a collaborative effort supported by the Village of Holly. "Most important, the signage project received unqualified support from Tim

"Most important, the signage project received unqualified support from Tim Stallcup, from the very beginning. Tim provided historical data and worked with local artist Gayle Vandercook to develop the design."

SUE JULIAN

Stallcup from the very beginning," says Julian. "Tim provided historical data and worked with local artist Gayle Vandercook to develop the design."

Stallcup adds, "Another good feature of the sign is that we are putting out the word that we are as concerned about discharging clean water as the paddlers are." While the sign is a positive feature, Stallcup says that next to plant cleanliness, his team's biggest source of pride is a SCADA system (ICONICS). "We operate the plant with a three-person staff, and that's pretty darned good for a plant this size." **tpo**

Share Your Ideas

TPO welcomes news about interesting features of your facility's grounds, signage or buildings for future articles in the PlantScapes column. Send your ideas to editor @tpomag.com or call 877/953-3301.

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The Beckton Sewage Treatment Works upgraded its odor-control capabilities by adding custom-engineered flat aluminum covers (CST Covers) to its primary sedimentation tanks.

PHOTOS COURTESY OF CST COVERS

Odor Under Cover

CUSTOM-ENGINEERED ALUMINUM SEDIMENTATION TANK LIDS HELP THAMES WATER ACHIEVE EFFECTIVE ODOR CONTROL AT ITS WASTEWATER TREATMENT PLANT IN BECKTON, UK

By Hector Moreno

Beckton Sewage Treatment Works is one of five wastewater treatment plants in the Thames Water network in the United Kingdom and the largest treatment plant in Europe. Headquartered in the London borough of Newham, it serves 3.7 million people, mainly in north and east London.

As part of a \$309 million upgrade to the Beckton plant, Thames Water engaged general contractor GBM to upgrade the plant's odor control capabilities. GBM looked for a solution that would cap and contain the odor from the facility's 16 primary sedimentation tanks while operating seamlessly with the equipment inside each tank.

The company found the solution in custom-engineered flat aluminum covers supplied by CST Covers.

The low profile minimizes the air space under the covers, lowering the volume of air to be treated. Less air to treat means the utility can install a smaller odor-control system at lower capital, operation and energy costs.

INVESTING IN IMPROVEMENTS

Thames Water, the UK's largest utility, provides water to 9 million people and wastewater services to 14 million in southern England, including parts of London. In 2010, the utility was authorized by its regulator, Water Services Regulation Authority (Ofwat) to invest \$8.1

billion over five years in its water and wastewater network under a national Asset Management Plan, known as AMP 5. The plan includes a broad array of upgrades to improve service quality, control costs, and mitigate the company's environmental footprint.

Thames Water is charged with controlling odor from the Beckton facility, which is surrounded by thousands of homes and businesses. Covering the sedimentation tanks, with a total area of 600,000 square feet, or the size of about 10 football fields, was a major challenge. CST reviewed the project specifications and worked with GBM and other contractors to deliver a cover for each of the 16 tanks.

"Aluminum covers are environmentally benign, structurally robust and operator friendly, and they require little to no maintenance," says John Delaney, senior vice president sales with CST Covers.

CUTTING COSTS

Each sedimentation tank now has a low-profile aluminum cover with a slight pitch to allow water drainage. The low profile minimizes the air space under the covers, lowering the volume of air to be treated. Less air to treat means the utility can install a smaller odor control system at lower capital, operation and energy costs.

The covers have a series of inspection hatches that operators can

Share Your Idea

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Send your ideas to editor@tpomag.com or call 877/953-3301.

The Beckton treatment works, the largest treatment plant in Europe, serves 3.7 million people in north and east London.

safely access from any point on the cover system. Operators can conduct routine maintenance without entering the tanks and being exposed to odorous air. The 150-pound modular panels can be easily removed by two operators. This will be beneficial during tank maintenance when small equipment needs to be set inside the tanks.

WORKING WITH THE MACHINERY

While containing odors, the covers had to accommodate a system of scrapers inside each tank that gather settled sludge and push it to a collection tank. The scraper systems were to be suspended from the covers' primary support beams.

The challenge was to incorporate the dynamic loads from the scraper system into the cover design without compromising the performance of the scrapers or the covers. The beams were spaced according to the scraper system's requirement for supports at 6-meter (20-foot) intervals. The hanging support system design ensured that the scraper systems could

Operators can conduct routine maintenance without entering the tanks and being exposed to odorous air.

be placed at the required elevations while providing some flexibility during installation.

The sludge trough at the end of each tank was the most challenging aspect of coordinating with the scrapers. The trough is sloped and has scraper tracks and a piston running through it. Since each primary support beam was vertically supported by a stainless steel column, there would be direct interference with the track and pistons. In response, CST developed an intricate triangulated support system that avoids the track and spreads the load from the covers into the sloped wall.

"The design of the support columns in the trough area required input from GBM, the scraper equipment supplier, and CST," says David Brahm, P.E., lead structural engineer with CST. "We came up with a solution that satisfies the scraper system clearance envelope and maintains the structural integrity of the entire cover system."

The upgraded Beckton plant with its new odor control capability plays an important role in Thames Water's performance, sustainability and customer satisfaction and serves as a model for treatment works throughout Europe.

ABOUT THE AUTHOR

Hector Moreno is a regional sales manager for CST Covers, specializing in design, manufacture and construction of custom covers for architectural, environmental and industrial sites. He can be contacted at bmoreno@cstcovers.com tpo



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The Fort Knox Wastewater Treatment Plant, owned by Hardin County Water District No. 1 and operated by Veolia Water, was accepted into Kentucky's Voluntary Protection Partnership Program (VPP), a national program overseen by OSHA. (Photography by Jay May)

Attitude of *Excellence*

HEALTH AND SAFETY IMPROVEMENTS ALLOW THE FORT KNOX TREATMENT PLANT
TO ACHIEVE COVETED STAR STATUS IN KENTUCKY'S VOLUNTARY PROTECTION PROGRAM

By Trude Witham

TO JUSTIN METZ, SOMETHING IN FORT KNOX IS MORE VALUABLE THAN the material stored in the United States Bullion Depository nearby. That's the safety of his team at the Fort Knox (Ky.) Wastewater Treatment Plant.

In October 2012, the plant was awarded Star status under the state's Voluntary Protection Program (VPP). Although the VPP has been around since the early 1980s, only three other wastewater treatment facilities in the U.S. have won Star status, and Fort Knox was the first in Kentucky to do so.

"The VPP was not easy to achieve, and in fact it took us three years of hard work," says Metz, operations supervisor and safety coordinator for the plant, owned by the Hardin County Water District No. 1 and operated by Veolia Water North America. "It's not a one-time award, but an ongoing partnership. It requires high employee involvement, so everyone has to be rowing the boat in the same direction."

The Kentucky VPP is offered by the state Division of Education and Training to recognize and promote exemplary safety and health performance. Participants must meet rigorous qualifying criteria and undergo an extensive on-site evaluation to be certified. That includes an in-depth work site hazard analysis, detailed records review, and employee safety and prevention program and training.

"The motivator for signing on to the program and achieving Star status was to go above and beyond our normal health and safety program, and to run the best facility we can," says Metz. "The program resulted in a culture and mindset change in how we handle operations across the board. We upped the ante on our expectations as a plant."

Metz describes the plant's culture change as "remarkable," as employees develop an "attitude of excellence" that affects all parts of the operation: process control changes, reduced energy consumption, and collection system improvements that cut back on inflow and infiltration.

profile

Fort Knox (Ky.) Wastewater Treatment Plant



BUILT:	1995
POPULATION SERVED:	31,000
EMPLOYEES:	16
FLOWS:	6 mgd design, 1.8 mgd average, 18 mgd peak
TREATMENT LEVEL:	Secondary
TREATMENT PROCESS:	Activated sludge, oxidation ditch
RECEIVING WATER:	Mill Creek
BIOSOLIDS:	Aerobic digestion, landfill
ANNUAL BUDGET:	\$2.86 million
WEBSITE:	www.hcwg.com
GPS COORDINATES:	Latitude: 37°53'50.94" N; Longitude: 85°55'23.26" W

Justin Metz, left, operations supervisor and safety coordinator, and Kenneth Horn, operator, take a mixed liquor suspended solids sample.



The Fort Knox team includes, from left, Eugene Robillard, field technician; David Miller, electrician; David Evans, GIS technician; Marc Montgomery, operator; Anthony Link, project manager; Bobby Van Meter, field technician; Kenneth Horn, operator; Justin Metz, operations supervisor/safety coordinator; Jeffrey Kinder, operator; David Russelburg, field lead technician; William Mills and Chad Saunders, field technicians; Kenneth Morley, collections supervisor; Melody Martel, administrative assistant; and Michael Shanahan, field technician. Not pictured: Del Bradley, plant operator.

ON BASE

Built in 1995, the treatment plant is located at the Fort Knox Army Base. In 2005, the U.S. Army turned over plant ownership and operation to Hardin County Water District No. 1, based in Radcliff, through a privatization contract signed in 2004. Veolia Water operates the plant under a 20-year agreement. The system includes the 6 mgd treatment plant, 91 miles of sewer lines, and 39 lift stations. The plant serves the city's 29,000 residents along with portions of the Army base.

The activated sludge oxidation ditch plant consists of:

- Bar screens (Vulcan Industries)
- Influent wet well pumps (Flygt and ABS)
- Belt presses (Ovivo)
- TrojanUV3000Plus disinfection system (TrojanUV)
- Oxidation ditch aeration rotors (Lakeside Equipment Corp.)
- SCADA system (Rockwell Automation)
- Refrigerated samplers (Teledyne Isco 4700)

The UV system was installed in 2006, replacing chemical disinfection. The SCADA, added in 2007, replaced analog instruments. Collection system improvements reduced inflow and infiltration, and include:

- Lift station replacement (2012)
- Manhole rehabilitation (2006-2009)
- Cured-in-place pipe lining
- Sewer line repair and replacement (2012)

The yearly average flow is 1.8 mgd. "The plant was designed to support a full Fort Knox military mobilization effort, so we have an oversized plant for the amount of flow we normally receive," Metz says. "We have to use different process control strategies to optimize our wastewater treatment."



Justin Metz,
operations supervisor
and safety coordinator

The abnormally high detention times in the plant's oxidation ditch and clarifiers mean the operators have to maintain a low mixed liquor suspended solids concentration to keep from harboring significantly older sludge. "The challenge lies in having the mixed liquor at an age where the sludge is kept as young as possible, yet old enough to adequately remove BOD and ammonia," Metz says.

AWARD-WINNING TEAM

Besides the VPP award, the operations team has won an Operational Excellence Award from the Kentucky-Tennessee Water Environment Association for 2008-2011 for having no more than one NPDES permit violation per calendar year. The Fort Knox plant has had no violations in the past five years.

The operators take pride in their jobs and are a multi-talented group, making process control changes, maintaining operational computer databases, performing lab work, turning wrenches, changing oil and performing housekeeping. Metz holds a Class IV (highest) wastewater license and a bachelor's degree in biology from Indiana University; he has been with the plant for seven years. Other team members are:

- Project manager Anthony Link, Class IV, 7 years
- Operators Marc Montgomery, Class IV, 7 years; Jeffrey Kinder, Class III, 4 years; Kenny Horn, Class IV, 3 years; Del Bradley, Class III, 2 years
- Collection system supervisor Kenny Morley, 1 year
- Administrative assistant Melody Martel, 1 year
- Electrician David Miller, 2 years
- GIS technician David Evans, 1 year
- Field technicians David Russelburg, Class IV, 7 years; Chad Saunders, Class III, 4 years; Mike Shanahan, Class III, 6 years; Bobby VanMeter, 2 years; Gene Robillard, 1 year; Bill Mills, 1 year

Operators perform process control laboratory tests for dissolved oxygen, pH and residual chlorine. They also handle preventive and corrective maintenance and perform grounds work, such as lawn mowing and concrete pressure washing.

"The process of becoming a VPP work site was eye-opening. It made our entire team better and more educated."

JUSTIN METZ

Veolia Water pays for traveling expenses and registration fees and allows work schedule modifications so that employees can earn and maintain certifications. The company also pays for memberships in the Kentucky Water & Wastewater Operators Association.

Team members receive training during monthly safety meetings on topics such as confined spaces, hazard communication, electrical safety and personal protective equipment. They also receive outside training.

REACHING FOR THE STAR

Metz heard about the Voluntary Protection Pro-

"It's not a one-time award, but an ongoing partnership. It requires high employee involvement, so everyone has to be rowing the boat in the same direction."

JUSTIN METZ

gram in 2007 from a Veolia Water project in Atlanta, Ga. "I did some research on the Kentucky VPP website and spoke with a few people familiar with VPP," he says. "I could foresee the benefits of going through the program. I talked the VPP up to my staff, and told them it was the benchmark for a health and safety program. I presented it as a challenge for them to work toward."

Project manager Link committed the resources for the program and led by example, taking part in every safety meeting and conducting monthly inspections. He also did job observations, watching team members perform tasks and making sure they followed safety policies and procedures. The

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ALL ABOUT INITIATIVE

When the Fort Knox Wastewater Treatment Plant signed on to the state's Voluntary Protection Program (VPP), auditors found some areas for improvement. "Some items were minor and others required innovation and initiative to solve," recalls Justin Metz, plant operations supervisor and safety coordinator. "All the employees embraced the challenge and worked diligently to bring our safety program to the VPP level."

A few employees especially went above and beyond to meet the challenges. "Operator Kenny Horn wrote an all-encompassing document that explains what the plant's safety program is about, what the VPP standards are that the plant wants to meet, and how we can meet those standards," says Metz.

Auditors were concerned that operators working alone on nights and weekends could have an emergency requiring an eyewash or safety shower, but have no one else on site to call for medical assistance. Plant electrician David Miller, solved the problem by installing flow switches in the water lines to the eyewash stations and safety showers. Operator and journeyman plumber Del Bradley plumbed in flow switches at all eyewash/safety shower locations, and Miller wired them and programmed them into the SCADA system.

When triggered, the flow switches send an alarm to the SCADA, which sends a text message to the off-site supervisor and project manager, who notify emergency personnel.

"The VPP auditing team wanted to know if we had a way to identify and assess trends," says Metz. "While the Veolia Water corporate team does trending and tracks incidences for the entire company, we did not have a site-specific system in place. Operator Jeffrey Kinder designed a spreadsheet with macros to allow trend analysis." Staff members can enter near-miss hazards and root causes into the system and easily evaluate trends for all categorized data.

water district supported the effort by funding necessary improvements and standing behind Veolia Water in pursuing the goal.

Monthly safety meetings allowed the staff to discuss the status of VPP goals. Acceptance requires a two-phase review. Phase I is a forensic review of plant policies, procedures, record keeping, training and culture analysis. Phase II is an extensive hazard analysis.



Justin Metz conducts a preventive maintenance inspection on a UV module from the TrojanUV3000Plus system.

"During our three-year effort to get into the program, Kentucky VPP auditors visited our site about 10 times, sometimes for multiple days," says Metz.

After the auditors pointed out deficiencies in the health and safety program, plant staff created a spreadsheet listing the issues, corrective actions, the person responsible, and completion dates. "This is where the attitude of excellence really showed up," recalls Metz. "At regular meetings, I would review the spreadsheet with the staff, and they would volunteer to address issues they thought were within their capabilities."

Regional safety manager Jay Ritchey facilitated necessary changes at the corporate level. Metz and Horn worked diligently to critique and revise site-specific elements of the health and safety program.

CORRECTING ISSUES

While all 16 staff members were involved, the operators and collection system field technicians were responsible for correcting physical hazards the VPP audit team found. For example, the openings in the grating next to the gate valves were too wide. Horn measured and cut the angle steel, Kinder painted the steel with corrosion-resistant two-part epoxy paint, and Bradley mounted the newly fabricated toe boards by setting all the concrete anchors and bolting them in place.

The VPP auditors felt the existing slap gates, which prevented entry into the oxidation ditch rotor drive pits, were too low and could easily be stepped over. "Because of the existing hand rail design, we couldn't simply raise the slap gates," says Metz. "Kenny Horn designed and in-house fabricated extensions onto the slap gates to prevent the possibility of stepping over them."

(continued)



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Jeffrey Kinder prepares a chlorine residual standard.

"I could foresee the benefits of going through the program. I talked the VPP up to my staff, and told them it was the benchmark for a health and safety program. I presented it as a challenge for them to work toward."

JUSTIN METZ

Collection system employees increased their involvement in the safety program, giving training presentations, writing new standard operating procedures, and making hazard prevention repairs. As a result of the VPP, administrative assistant Melody Martel manages the hazardous communication program, updating Material Safety Data Sheets (MSDS) and conducting MSDS training.

KEEPING IT FRESH

Maintaining the culture change is an ongoing challenge. "The VPP forced us to make a change from 'This is what we have to do,' to 'This is what we want to do,'" says Metz. "Now, the attitude is 'Let's do a safety analysis of this job before we get started.'"

The VPP team came to the plant and performed a cultural analysis by interviewing each team mem-

ber. "They asked them what they do and how they do it, and they came back with the results," says Metz. "It turns out the plant had an 'immature culture climate.'"

"Our employees were looking at things reactively instead of proactively," says Metz. "The staff scored well enough to get into the program, but the VPP administrator will want to see higher culture analysis scores when he conducts the survey again in three years." It took time, encouragement and diligence to change the culture: "You can't throw something out there and expect it to stick. You have to keep at it constantly."

Today, Metz says, "More employees are taking a leadership role during safety meetings. They are continually making suggestions that make our jobs easier, more efficient and safer. The process of becoming a VPP work site was eye-opening. It made our entire team better and more educated."

The greatest challenge now is to keep interest in the VPP fresh: "We can't let the honeymoon wear off. It's not a one-time award. You're in for three years, and when the three years are up, the VPP team conducts an audit to see whether you're still worthy." **tpo**

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Fort Knox Wastewater Treatment Plant PERMIT AND PERFORMANCE

	PERMIT (monthly average)	EFFLUENT (average)
BOD	15 mg/L	4 mg/L
TSS	30 mg/L	7 mg/L
E. coli	130/100 mL	7/100 mL
Ammonia	May-Oct: 2 mg/L Nov-Apr: 5 mg/L	0.44 mg/L

Kenneth Horn programs the plant's Teledyne Isco 4700 refrigerated sampler.

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Two of three 70-foot-diameter primary clarifiers (WesTech) are visible on the right, one of three 82-foot-diameter secondary clarifiers is on the left, and the three aeration tanks (624,000 gallons each) are in the background.



Lab analyst Ashley Warren performs routine CBOD analyses in the Amherst plant laboratory.

Nitrogen Removal at Bargain Cost

EFFECTIVE USE OF DATA HELPS TREATMENT PLANTS IN AMHERST, MASS., AND OTHER COMMUNITIES TAKE OUT NUTRIENTS WITHOUT COSTLY FACILITY UPGRADES

By Grant Weaver, P.E.

Nutrient removal can be expensive. To meet new nitrogen limits for the 7.1 mgd wastewater treatment plant in Amherst, Mass., a state study determined that a \$61 million upgrade was needed. Instead, the city is getting the job done for \$75,000 by making informed process changes.

Instead of pursuing the traditional facility planning, design and construction pathway to permit compliance, the Amherst staff, led by Jim Laford, superintendent, experimented with new ways of operating their 1979 vintage facility.

After a few failed attempts at dialing in ammonia and nitrate removal, the staff found that cycling the plant's mechanical aerators to alternate highly aerobic and marginally anoxic conditions provided the best treatment. After four months of experimenting with

shire College), Amherst's influent is highly variable. The treatment plant operates in a near-complete mix mode with a hydraulic retention time of about six hours. Two of three aeration trains are operated routinely, and two of three final clarifiers are typically used.

Amherst's process control strategy starts with dissolved oxygen (DO) probes near the midpoint of the two in-service aeration tanks — they help control the cycling of the mechanical aerators. Tanks independently cycle between oxygen-rich aerobic and oxygen-poor anoxic conditions.



As remarkable as Amherst's achievements may seem, they are not unique. Experience demonstrates that most municipal treatment plants can get similar results by using existing equipment differently.

process changes, effluent total nitrogen is 8 mg/L (roughly equal concentrations of TKN, nitrate, and nitrite). Effluent ammonia averages 0.5 mg/L. The new permit limit is 546.5 pounds per day total nitrogen, amounting to 9.2 mg/L at design flow.

Operating parameters are not yet established for all conditions, but early results are encouraging. The team expects to satisfy permit conditions at a \$60 million savings, with no increase in operations and maintenance costs.

VARIED INFLUENT

With nearly one-third of the flow and loading coming from area colleges (the University of Massachusetts, Amherst College and Hamp-

The plant's SCADA system maintains aerobic conditions for a set period of time once the target DO setting is reached. During aerobic treatment, the speed of each mechanical aerator is independently controlled to maintain a target DO level and thus optimize ammonia removal. Oxygen reduction potential (ORP) probes near each of the six operating mechanical mixers provide ongoing information on tank conditions.

After aerating for the desired time, the mechanical aerators slow down to a mixing speed to provide anoxic conditions and support biological nitrate removal. Using SCADA trend graphs for guidance, Duane Klimczyk, assistant chief operator, makes frequent adjustments to the SCADA settings to optimize ammonia and nitrate removal.

Because of the relatively short hydraulic retention time, the staff found it necessary to raise the aeration tank DO to 2.0 mg/L to provide effective ammonia removal. During aeration, the ORP reading climbs above +100 mV. The facility readily removes nitrate (denitrifi-

cation) with a short anoxic cycle and a relatively high anoxic ORP reading of +50 mV.

REPEATABLE RESULT

As remarkable as Amherst's achievements may seem, they are not unique. Experience demonstrates that most municipal treatment plants can get similar results by using existing equipment differently. Dozens of treatment plant managers are operating biological treatment plants not designed for nutrient removal to produce effluents with total nitrogen at 5 to 8 mg/L, or total phosphorus at 0.5 to 1.0 mg/L, or both.

For example, 10 Connecticut municipalities are achieving the same 6 mg/L total nitrogen without upgrades as 48 facilities upgraded at an average cost of \$6.15 million. The equipment cost for the non-upgraded facilities averaged less than \$50,000. Because most of the process changes involve the creation of anoxic zones, most are aerating less and are therefore using less electricity.



One of the plant's nine mechanical aerators.

The 4.0 mgd facility in Keene, N.H., is seasonally producing effluent with total phosphorus averaging 0.2 mg/L without filtration. The team in Montague, Mass., is using a creative sequenced aeration strategy to reduce total nitrogen to 7.0 mg/L and effluent total phosphorus to 1.0 mg/L. In Conrad, Mont., cycling of aeration in a manner similar to Amherst's produces effluent with total nitrogen averaging 4.0 mg/L.

MAKING IT HAPPEN

In Amherst's case, Hach ORP probes were installed alongside each of the plant's six in-use mechanical aerators; six Hach DO probes were already in place. The new in-line instrumentation is connected to the plant's Control Logic SCADA system.

Mike Moore, chief electrician/programmer, programmed the RSView SE software (Rockwell Automation) to provide real-time information and automatic control of the variable-frequency drives that regulate the speed of the mechanical aerators.

Daily effluent testing for ammonia, TKN, nitrite, and nitrate is performed by Ashley Warren, lab analyst, using a Hach DR3900 spectrophotometer. Effluent pH and alkalinity are monitored using an Orion 420A laboratory instrument. To support the staff in optimizing treatment, Amherst's consultant provides almost daily data review and visits the site twice monthly to collaborate with the staff.

A 2008 computer modeling of the plant concluded, "there are no operational or minor modifications/retrofits that could be implemented at this facility to consistently achieve nitrogen removal. The existing facility has half of the necessary volume at the current flows."

However, notwithstanding the variable flow, plant bacteria fail to recognize that they are incapable of providing nitrogen removal to an average flow of 4.2 mgd using two of the facility's three aeration tanks and two of the three final clarifiers. Computer modeling determined that five aeration tanks and four final clarifiers would be required.

ESSENTIAL INSTRUMENTS

Amherst's is not the only treatment facility that performs better than computer modeling found possible. Experience with dozens of treatment facilities shows that better-than-theoretically-possible nitrogen and phosphorus removal can be realized by:

- Gathering appropriate real-time data
- Reviewing the data frequently
- Using the data to take timely and appropriate actions

Nitrogen and phosphorus removal works best when the biological habitats are closely monitored and controlled. In-line equipment recommended for tracking environmental conditions includes DO, ORP, TSS, pH and alkalinity monitors. Instruments to provide vital feedback on treatment effectiveness include:

- Nitrite, nitrate and ammonia analyzers for facilities with nitrogen removal objectives
- In-line ortho-phosphate effluent TSS monitoring for facilities with phosphorus removal requirements

Amherst is using real-time data for decision-making, backed by consultant guidance. The facility is meeting its nutrient obligations with minimal capital investment after thoughtfully experimenting with new process control strategies.

ABOUT THE AUTHOR

Grant Weaver, P.E., is a Class IV wastewater operator and owner of The Water Planet Company in New London, Conn. He can be reached at grantweaver@thewaterplanetcompany.com. tpo

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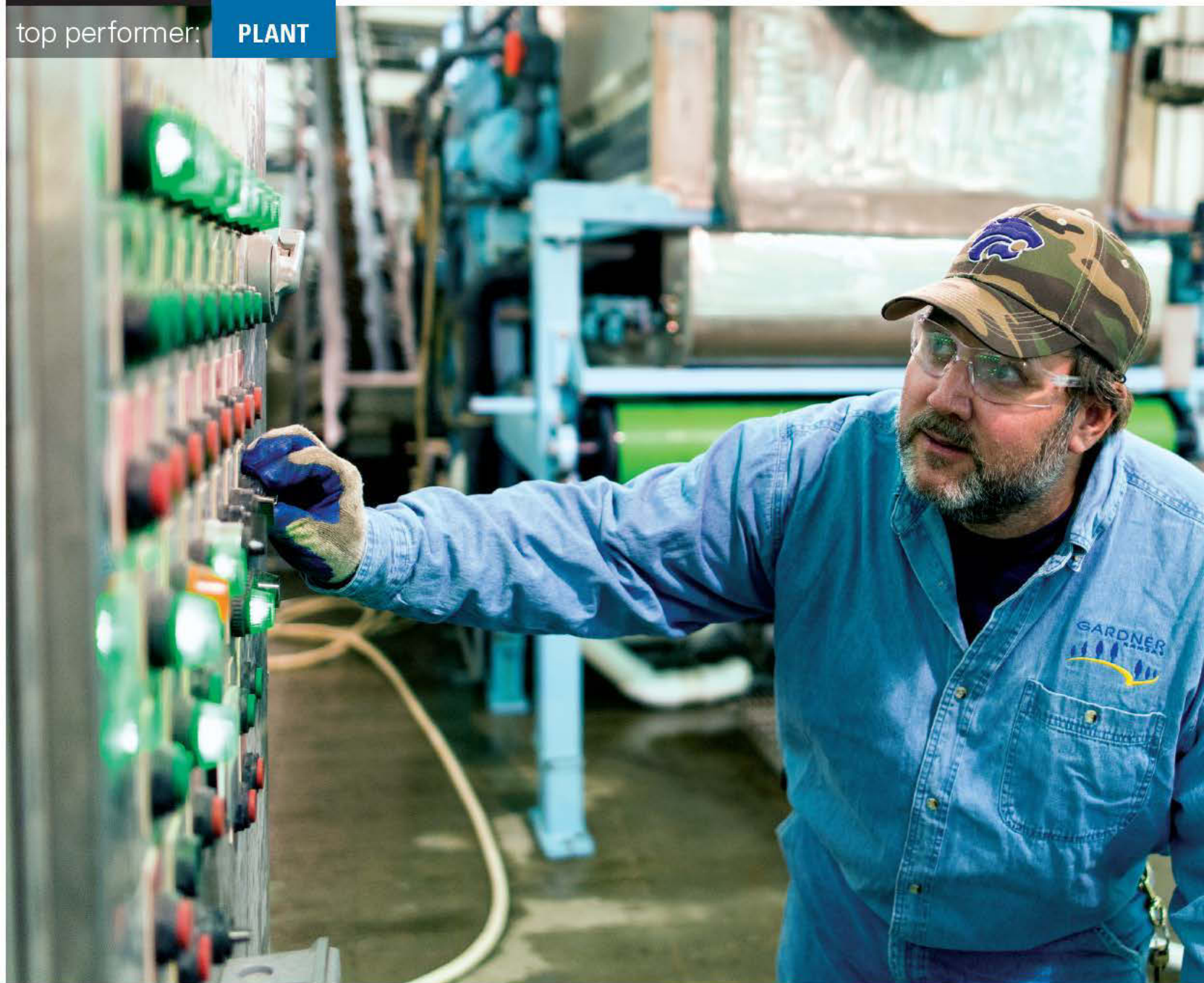
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Safe, Efficient, *Compliant*

By Jim Force

A SMALL BUT SAVVY TEAM AT THE KILL CREEK WASTEWATER TREATMENT PLANT
SETS AN EXAMPLE WITH TRAINING, ENERGY SAVINGS AND BIOSOLIDS PROCESS INNOVATION



Operator Carl Cook makes adjustments to the controls on the biosolids belt press (BDP). (Photography by Steve Puppe)

IF IT'S INDIVIDUAL INITIATIVE YOU'RE LOOKING FOR, TAKE A GANDER AT Gardner, Kan. There you'll find Scott Millholland and his crew of four keeping the Kill Creek Wastewater Treatment Plant spit-polish clean, cutting the grass, shoveling the snow, and doing 99 percent of the maintenance, while keeping the plant well within compliance and seriously safe.

And by the way, they've also optimized the solids handling process, saving the city at least \$40,000 a year, and have held plant operations expenditures at or below the previous year's level since 2007. "We do it all," says Millholland, wastewater supervisor, "and we love what we do."

Their efforts haven't gone unnoticed. Without a permit violation in more than 10 years, the Kill Creek facility was the Kansas Water Environment Association Plant of the Year in 2004, 2005, 2007 and 2012. And in three of those years, it also won the KWEA's Safety Award.

NUTRIENT REMOVAL

The Kill Creek plant was built in 2001 to serve Gardner, a city of 20,000 about 30 miles southwest of Kansas City. The city's population has doubled every ten years since 1980.

In 2001, Gardner operated just three

lift stations serving a sewer network of 61 miles. Today, there are 20 lift stations and 129 miles of sewers.

The main treatment process is activated sludge, using Kruger Bio Denitro phased oxidation ditch technology. The current design capacity is 2.5 mgd. Ultimate planned capacity is 7.5 mgd, and average daily flow is about 1.7 mgd.

Four Fairbanks Nijhuis submersible pumps lift wastewater to the headworks, which consist of a Muffin Monster grinder (JWC Environmental) and step screens and a wash press provided by Huber Technologies. Grit is removed with two Mectan grit chambers and a SAM grit screw (both from John Meunier).

Wastewater then passes to the phased-flow oxidation ditch system, which removes BOD and nutrients. Treated water settles in a pair of rapid sludge removal sedimentation basins (Ovivo) and then is disinfected in a dual-channel UV light system (Aquionics).

Effluent cascades down aeration steps to Kill Creek and ultimately to the Kansas River.

profile Kill Creek Wastewater Treatment Plant, Gardner, Kan.

BUILT:	2001
POPULATION SERVED:	20,000
FLOWS:	2.5 mgd design, 1.7 mgd average
TREATMENT PROCESS:	Activated sludge
RECEIVING WATER:	Kill Creek (tributary to Kansas River)
BIOSOLIDS	Land-applied application
AWARDS:	Kansas WEA Plant of the Year 2004, 2005, 2007, 2012; Kansas WEA Safety Award 2004, 2007, 2012
ANNUAL BUDGET:	\$1.2 million (operations)
WEBSITE:	www.gardnerkansas.com
GPS COORDINATES:	Latitude: 38°50'13.70" N; Longitude: 94°57'24.42" W



A fiber-optic SCADA system (Kruger) monitors and controls all plant processes. Biological odor control keeps the plant odor-free. Odorous air passes through three chambers filled with stone-type media, and odors are stripped off using effluent water.

Biosolids are removed from sedimentation basins, thickened, aerobically digested, dewatered on a belt press (BDP Industries) and applied to area farms by Synagro.

Millholland and his staff—senior operator and lab technician Steve Duke, operators Carl Cook and Matt Solorio, and maintenance specialist Dave Birzer—also take care of the lift stations. Five have submersible pumps and the rest use vacuum primed pumps (Smith & Loveless).

SOLIDS SAVINGS

From the time the plant was built until 2008, Gardner also operated an aging fixed-film treatment plant and a package plant. Flow then averaged just 0.9 mgd, but when the old plants were taken out of service, the flow rose to 1.7 mgd. In the process, biosolids handling costs went up 20 percent, to about \$120,000 a year.

"The higher costs, plus the downturn in the economy, pushed us to examine our plant operation and look for ways to trim costs," Millholland says. Comprehensive measures to save energy would have taken too long;



The Kill Creek plant was built in 2000-2001 to serve the community of Gardner, 30 miles southwest of Kansas City. The city's population has doubled every ten years since 1980.

"We do it all, and we love what we do."

SCOTT MILLHOLLAND



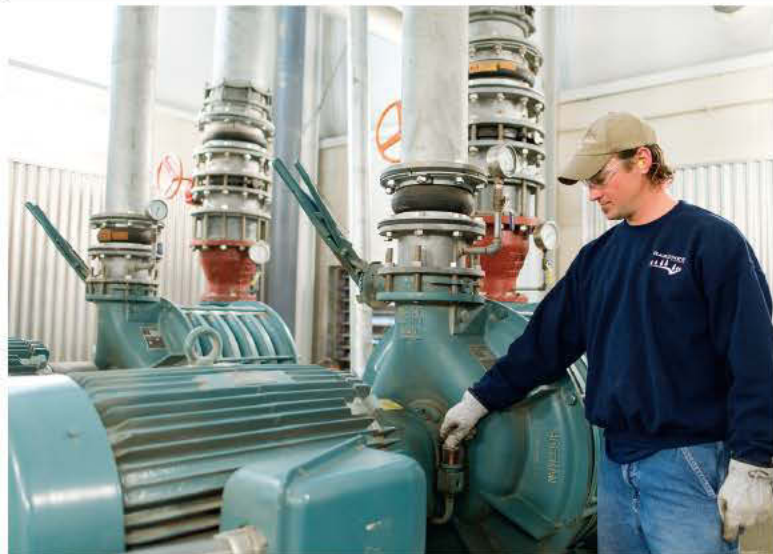
Maintenance technician David Birzer checks dissolved oxygen readings in the oxidation ditch (Kruger).

"The effect would not have been felt quickly enough. Instead, we felt that fine-tuning plant operations was the most promising avenue to cutting costs." They took several measures:

- Increasing solids wasting time in the aerobic digestion process from 40 to 60 minutes.
- Adjusting the change in wasting time slowly, at intervals of about two to three weeks.
- Alternating between sludge digester basins from month to month.
- Shutting off the air to the digesters for 24 hours and then decanting three to four feet of supernate from each side using stem pipes. As a result, about 98,000 gallons per side did not need to be processed.
- Reducing filamentous bacteria in the aerobic digestion system by alternating basins, adjusting wasting time, and lowering drawdown.



The Kill Creek plant team includes, from left, Scott Millholland, wastewater treatment supervisor; David Birzer, maintenance technician; Matt Solorio, operator; Steve Duke, senior operator; and Carl Cook, operator.



REUSING WASTE OIL

Treatment plants across the United States are looking to slash energy costs. The City of Gardner is engaged in a comprehensive energy savings audit and plan. Meanwhile, Scott Millholland and his team at the Kill Creek Wastewater Treatment Plant have come up with a novel way to reduce energy costs — used oil.

"We have a large maintenance shop where we do most of our own maintenance," he reports. "Rather than heat the building conventionally, we have started to use waste oil — used motor oil, the waste oil from our pumps, used oil from our vehicle fleet, and oil from the two big generators we have at the plant."

Millholland learned about used-oil burners from a friend who runs a trucking business, and he purchased one for use in the maintenance shop. "It really does a nice job," he says. He has seen a two-year payback on the equipment: "We burn about 210 gallons of used oil a month and have experienced savings of \$5,000 to \$6,000 a year."

In other energy-saving measures, the Kill Creek crew added insulation to the office area and adjusted the outside air feed to the UV disinfection building, the plant lift station, and three of the larger lift stations. Those efforts have saved another \$1,000 a year.

These actions have thickened biosolids in the aerobic digestion system to between two and three percent solids before the material is sent to dewatering. Millholland estimates these changes have reduced biosolids production by 40 percent, saving about \$40,000 per year.

The replacement of two old drying beds with a used belt press for dewatering has increased cake solids from 7 to 16 percent, reducing solids handling costs by another \$20,000 a year. "Overall, our solids handling costs are down a total of \$60,000 a year, from \$120,000 to \$130,000 a year previously," says Millholland.

The Gardner team saved an additional \$10,000 to \$15,000 a year by reviewing chemical usage for grease control in the lift stations. They've also started using their vacuum trucks for cleaning the stations and see much better results. The plant laboratory became a Certified Environmental Laboratory in March 2012, and that has netted even more savings, while helping with daily process control. Hach and YSI supplied most of the lab equipment.

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Kill Creek Wastewater Treatment Plant PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT
BOD	460 mg/L	Not detected	30-45 mg/L (seasonal)
TSS	520 mg/L	2-3 mg/L	45 mg/L
Phosphorus	6.0 mg/L	0.52 mg/L	Monitor only
Ammonia nitrogen	23.1 mg/L	Not detected	4.9 mg/L
TKN	50.8 mg/L	0.96 mg/L	Monitor only

SAVINGS IN SAFETY

Millholland and the Gardner crew also have saved money by operating safely. “We’ve really been proactive on safety the last five years,” Millholland says. “When we boil down our worker’s compensation and insurance costs, we see significant savings. We like to have all staff get at least 40 hours a year of outside training, and this could be in the areas of operations, maintenance or safety.” Training is provided through the Kansas Department of Health and Environment, area community colleges and local vendors.

Millholland believes the training develops better, safer and more knowledgeable employees. Overall, the city has reduced worker’s compensation insurance premiums by 46 percent since 2010. “We have also received all plus points from KERIT [Kansas Eastern Regional Insurance Trust] for the last five years for our work with the safety committee and our safety program,” Millholland says. “The efforts of all city departments resulted in a savings of over \$200,000.”

The treatment plant has not had a lost-time accident since it opened. “We work together as a team,” Millholland says. “You can really see the dividends.”

The key to safe performance is communication: “We have daily safety tailgate meetings. We sit down every morning, and then at the end of the day before we go home. We discuss concerns or complaints, making sure we’re all on the same page. It’s a team effort.”

Cleanliness and neatness also count. “Our plant is super clean — one of

the cleanest around,” says Millholland. “We host a lot of tours with students and scouting troops. Because we have a water tower on the property, a lot of people think we’re a water plant. Just because we’re a wastewater treatment plant doesn’t mean we have to look like one.”

A clean, safe plant that conserves energy, saves money, and consistently meets its permit — that’s a formula to make any city proud. **tpo**

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GREEN BAY'S CLEAN-WATER AGENCY LAUNCHES A NEW IDENTITY TO FOSTER MORE POSITIVE PUBLIC PERCEPTIONS AND REFLECT A GROWING ROLE IN RESOURCE PROTECTION

By Ted J. Rulseh

A clean-water agency's name sets the tone for the way public perceives it. So when agencies call themselves "sewerage districts" or "sewer commissions," the public gets the wrong idea. That is, people think of the raw material, and not the end product.

The Green Bay (Wis.) Metropolitan Sewerage District is among agencies that have created new identities that better reflect their ultimate purpose. While GBMSD remains its legal name (at least for the time being), it is now known to the public as NEW Water.

The NEW reflects both its job, which is the reNEWal of water, and its area of service, which is NorthEastern Wisconsin. The identity embodies the agency's broadening role in water quality, which includes reaching upstream into the watershed in efforts to help regulate phosphorus loadings to Green Bay and the Fox River.

NEW Water reclaims water and promotes pollution prevention and water conservation in a 285-square-mile area in and around the City of Green Bay, serving some 217,000 residents. The agency owns clean-water plants in Green Bay and De Pere that together process an average of 38 mgd.

Executive Director Thomas Sigmund, P.E., treatment manager Bruce Bartel, and communications and education coordinator Tricia Garrison talked

"Our agency was looking at itself and trying to determine how we would fit within the concept of the utility of the future. The way we looked at it, wastewater and sewerage are not what people want to talk about. What they want to talk about is water in its broadest sense."

THOMAS SIGMUND

about the rationale behind the agency's new identity, and the steps they have taken to introduce it to employees and the public, in an interview with *Treatment Plant Operator*.

tpo: What was the basic thought process behind changing to this new identity?

Sigmund: As we look at our mission going forward, this new identity contains elements of the "Water Resources Utility of the Future" report released last February by the Water Environment Federation (WEF) and the National Association of Clean Water Agencies (NACWA). I served on the task force that developed that report.

Our agency was looking at itself and trying to determine how we would fit within the concept of the utility of the future. The way we looked at it,



From left, NEW Water Executive Director Tom Sigmund, communications and education coordinator Tricia Garrison, and treatment manager Bruce Bartel.

PHOTO COURTESY OF NEW WATER

wastewater and sewerage are not what people want to talk about. What they want to talk about is water in its broadest sense. That will become even more true as we move out into the watershed and talk to stakeholders about issues that are important to them.

tpo: What is the purpose of increasing outreach into the watershed?

Sigmund: At our two treatment facilities, we do an excellent job of removing nutrients — other pollutants as well, but nutrients are the main concern, and in particular phosphorus. We are well below our current permit limit on phosphorus, which is 1.0 mg/L. But the state's new phosphorus rule sets a limit of 0.2 mg/L or lower for point sources, and there is a total maximum daily loading for phosphorus and sediment for the Lower Fox River.

These new rules do provide some flexibility with provisions for adaptive management. That's an opportunity for NEW Water and its customers to find more effective and lower-cost ways to manage nutrients from the entire watershed that discharge into the river. As we talk to people in the watershed about managing nonpoint sources of phosphorus and suspended solids, we'll be having conversations with people who may not be direct customers of our facilities. We'll be talking about water, watersheds and water resources — not sewage. We see our role changing, and we see our new brand as one of the best ways to communicate that.

tpo: What are the potential costs of complying with the new phosphorus rules?

Sigmund: We've done engineering studies looking at the cost to comply with the rules. If we were to comply by building new coagulation, filtration, disinfection and pumping systems at the plant level, that would require \$230 million in capital, in today's dollars. While we haven't fully identified the cost to comply through adaptive management, we believe it will be much less. We can do it more cost-effectively by working with others in the watershed, rather than by building new facilities at our plants.

tpo: Were there other reasons behind the new identity?

Bartel: We need to attract more younger people into this industry. Younger folks tend to be environmentally conscious, and a name like NEW Water, compared to a name related to sewerage or wastewater treatment, might be a nudge to get those people interested.

Sigmund: We're about improving water quality — transforming what had been a waste into something valuable to the community. Who doesn't

(continued)

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"I've been here 28 years, and other people have been here longer than that. You change the name of the company, they question why you're doing it. Some of our folks in the field said, 'We are what we are. We're a sewage plant, a wastewater treatment plant.' But if you talk to them and explain why, they say, OK." "

BRUCE BARTEL

want clean water? The message for younger people is: You'll be involved in the very complicated and challenging task of creating clean water. As part of any branding, you try to make yourself attractive to the talent pool you need in the future. This is a great opportunity.

tpo: How would you describe the process you followed to arrive at the new name?

Sigmund: We hired a local consultant, called Element, to assist us. They did market research. They interviewed our staff, our customers and other stakeholders to get a sense for who we are and where we should go. They summarized the work they had done and offered some options in terms of a name and logo that might communicate our identity. From there, we worked with our staff, testing out some of the ideas. We also asked our five-member appointed commission for their insights. Then last December we went to the commission with a final recommendation on the new name and logo.

Garrison: We did involve our staff. We asked their feedback throughout the process, and we incorporated it into the rebranding. For example, we sent around a few fun surveys, asking: What are the top 10 words that come to mind when you think about what we do? What colors come to mind? It was very illuminating, and it showed just how proud and dedicated our staff really are.

tpo: What is the significance of the NEW in NEW Water?

Sigmund: In this area, NEW is often used for Northeastern Wisconsin by entities that are somewhat regional in their reach. One example is NEW North, an organization that is looking to create a positive business climate. While we have been the Green Bay Metropolitan Sewerage District, we also have facilities in De Pere, and we serve customers across 17 municipalities, so we are bigger than just Green Bay. We looked at having "clean water" in our name, but in the end we settled on NEW Water as something very simple and appropriate.

tpo: Sometimes initiatives like this are seen as empty exercises in image polishing. Was there any resistance to the new identity among the agency staff?

Sigmund: There's always a concern about whether it's a good use of money. People say, "We've had this name for 81 years — why do we need a new name?" But we've had a lot of very positive comment.

Bartel: I've been here 28 years, and other people have been here longer than that. You change the name of the company and they question why you're doing it — and they should question. Some of our folks in the field said, "We are what we are. We're a sewage plant, a wastewater treatment plant." But if you talk to them and explain why, they say, "OK."

At our facilities, we take in raw material, which is wastewater, but what we produce is clean water. Most businesses don't talk about their raw material. They talk about what their finished product is."

tpo: How have you gone about rolling out this new identity to your stakeholders and the community?

Garrison: We felt our audience first and foremost was our own staff. We wanted them to know before anyone else. Tom (Sigmund) gives regular briefings to our staff, which we hold over a number of days so that everyone on different shifts can attend. At one of these, Tom explained the re-branding and why we were doing it.

We had a couple of branded items printed up in advance, including a lab coat with our new logo on it. Tom's size wasn't available — it came up about to his elbows — but he was a good sport, and he wore it for the presentation.

To build excitement and let people have a little ownership of the brand, we're creating a branded item for every staff member. They can choose a polo shirt or a duffel bag. We had sample items at those employee briefings so everyone could see up close how the new identity would look in execution.

We also created a one-page pdf document that we shared with the whole staff so they could share it with others to explain the new name and what it means.

tpo: What was the response from members of the community?

Garrison: We issued a press release to the local media, and we had a very positive article in the *Green Bay Press Gazette*, which is our main local newspaper. Tom sent a letter to all our customers and our vendors.

We also had an exhibit at a fair sponsored by the Einstein Project, an organization that provides science kits to public schools in this area. We did water filter demonstrations with the kids and talked to the parents about what we do. We had a banner. We had a nice array of employee volunteers there who wore the branded lab coats. We had a one-page flyer, pencils, calculators. We had about 5,000 visitors to our booth.

"We've provided quality service for over 80 years, and now we have a new, rejuvenated mission. We need all hands on deck for this because water quality is one of the biggest concerns of our century."

TRICIA GARRISON

tpo: What will the marketing effort look like going forward?

Sigmund: It's going to be ever-widening circles. We know the launch didn't hit everybody in our service area, but we'll continue to reach out through events and other opportunities to let people know that we are NEW Water and what our mission is. As we get into the summer where people are outside and closer to the water, we will have more opportunities to do that.

I think once we've been able to deliver our message and people think about water, most will say, yes, that makes sense. Water is our biggest resource in this community — the river and the bay — so having a broad-based conversation about water is only natural.

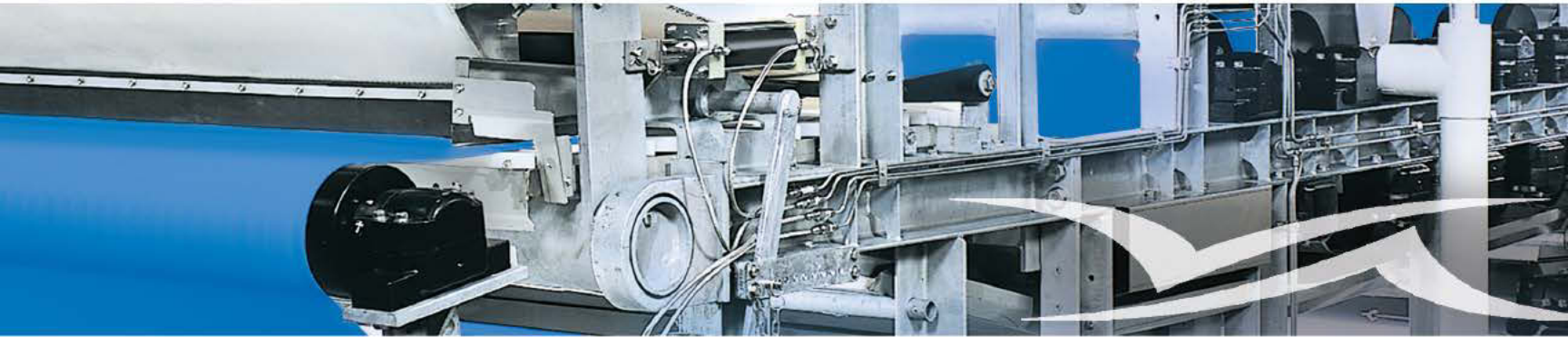
tpo: It seems you'll be significantly raising your profile in the community.

Garrison: Yes. For decades, people have said the Green Bay Met was the best-kept secret in town. People didn't know what we were doing here, and for a lot of our staff, that was just fine. We've provided quality service for over 80 years, and now we have a new, rejuvenated mission. We need all hands on deck for this because water quality is one of the biggest concerns of our century.

I think it's a worthwhile exercise because it restores people's excitement, especially when we'll be taking on new tasks with adaptive management. As we go out into the watershed to forge partnerships where we've never done that before, it will help for people to better understand and buy into what we're doing.

When I talk to colleagues, I hear stories about how they're telling their friends and families. Word travels fastest by the grapevine, and as people spread the word through their own networks, we're only hearing positive feedback. It's getting people to buy into the mission more than ever before. We're proud to keep doing what we're doing, and we're excited to take it up a notch. **tpo**

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COMBINED HEAT AND POWER AND A HOST OF OTHER ENERGY INNOVATIONS MEAN \$750,000 IN DOCUMENTED SAVINGS — SO FAR

By Doug Day

When the Rochester (Minn.) Water Reclamation Plant needed to expand, plant manager Chet Welle wanted to find long-term savings to help offset the cost to customers. “Energy savings was one of the things I really focused on,” he says.

In the five years since the \$4.7 million expansion, which boosted capacity from 19.1 mgd to 23.85 mgd, the plant has received \$253,000 in rebates from the local natural gas utility, Minnesota Energy Resources. Each rebate was equal to the demonstrated savings from one year of operation of biogas and heat recovery equipment added after the expansion.

However, it is the ongoing energy savings that will mean the most to customers — \$750,000 a year documented so far, or about 10 percent of the plant’s \$8 million annual operation and maintenance budget.

ELECTRICAL SAVINGS

The plant consists of two parallel systems sharing a headworks. Influent is split between the original two-stage high-purity oxygen

“Everything is heated by waste heat recovery for much of the year. We supplement with natural gas in the coldest part of the year.”

CHET WELLE



The plant staff of 25 includes four full-time and three relief operators.



UPPER PHOTO: Minnesota Energy Resources representative Rory Lenton with one of the Rochester plant’s Waukesha engines (GE Energy).
LOWER PHOTO: Lenton with the exhaust gas heat recovery boiler.

(HPO) activated sludge treatment process built in 1982, and the new single-stage activated sludge treatment process with conventional aeration. The effluent from both is combined for chlorination and dechlorination before discharge to the Zumbro River. Its two 1.85-million-gallon anaerobic digesters are fed from a common solids handling facility.

Combined heat and power has been used since the plant was built. The original system consisted of two 400 kW biogas engine-generators with exhaust gas and jacket water heat recovery. The first of the old engines was replaced in 2002, and the other in 2009, with new models 20 percent more efficient.

The Waukesha 1,000 kW lean-burn turbocharged engine-generators (GE Energy) are dual-fuel models that burn both biogas and natural gas. The projects included improvements to the jacket water and exhaust heat recovery systems, along with controls and switchgear, costing \$3.8 million in all.

"It doesn't work without a lot of cooperation. If you don't have a good SCADA system and make seasonal adjustments, it's not going to work. The staff running it right is what really saves you the energy."

CHET WELLE

A new exhaust gas heat recovery boiler was also installed in 2009 after an old boiler failed soon after installation. The new boiler cost \$291,000, but also brought a rebate of \$129,650 after its savings were documented. It was so effective that the plant added another such boiler to the second engine in 2010 and earned a \$99,650 rebate.

The financial payback for the boilers was 1.5 years, while the engine work has a payback of 9.4 years. "Emissions are also much better," adds Welle. "The emissions from two 1,000 kW engines are less than they used to be from one 400 kW engine."

With biogas production of 338,000 cubic feet per day (66 percent methane), the two engine-generators can continuously generate from 550 to 700 kW. The local electric utility, Rochester Public Utilities, provides various rate credits for a total savings of about \$260,000 a year. The plant also uses the generators for in-house peak shaving.

NATURAL GAS SAVINGS

Biogas generation and heat recovery saves the plant nearly \$370,000 a year over the cost of natural gas, 2.5 million Btu/hour from engine jacket water, and 2 million Btu/hour from exhaust gas heat.

"At 180 to 190 degrees F, it goes into a hot water transfer loop that covers the whole complex of 27 buildings on the eight acre site, including digester heating," says Welle. "Everything is heated by waste heat recovery for much of the year. We supplement with natural gas in the coldest part of the year."

And work continues. In late 2012, the natural gas utility provided a rebate of \$23,886 after the plant demonstrated a year of energy savings from insulating the roofs of its two digesters. Future plans include a FOG and high-strength industrial waste program and more biogas enhancements.

EFFLUENT THERMAL

The savings don't stop there. The facility has used effluent thermal recovery since 1982, though the savings couldn't be documented at the time for a lack of instrumentation. A second set of final effluent heat exchangers was added during the 2007 expansion, along with instrumentation that showed heat recovery equaled a natural gas savings of \$78,000.

"The effluent temperature is about 58 degrees F in winter," says Welle. "It might get down to the low 50s in a really cold stretch of weather. In summer, it runs around 62 degrees and could get as high as 70."

The effluent is used to cool all gas and air compressors and the high-purity oxygen air compressors. It also runs through HVAC coils to reduce

(continued)

BENEFICIAL SOLIDS REUSE

The Rochester Water Reclamation Plant spreads about 13 million gallons of Class B biosolids per year on farms on average just eight miles away. Plant manager Chet Welle says the farmers raise mostly corn and soybeans. The program saves them about \$600,000 a year in fertilizer costs. It also saves the plant the cost and energy of incinerating or land-filling the material. "We have very willing farmers," says Welle. "We have a pretty big backlog of people who want our product."

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heating and cooling costs, provide a heat sink for summer cooling, and preheat buildings in winter.

The plant has just added a new train of effluent thermal energy for heating the primary clarifier. Effluent that enters at 55 degrees goes through the HVAC preheat coils, a heat pump, and the HVAC secondary coils, and brings 77-degree air to the clarifier. Welle believes the savings could be as high as \$150,000 a year.

"The savings are real, but nothing is free," says Welle. "It doesn't work without a lot of cooperation. If you don't have a good SCADA system and make seasonal adjustments, it's not going to work. The staff running it right is what really saves you the energy." **tpo**



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Where Will We Go With Training?

A CERTIFIED TRAINER OFFERS PERSPECTIVES ON TRAINING BUDGETS, ONLINE VERSUS CLASSROOM TRAINING, LICENSING RECIPROCITY, STANDARDIZED BASIC EXAMS, AND OTHER RELEVANT TOPICS

By Ron Trygar, CET

Editor's Note: TPO's "Lab Detective" columnist was invited to speak at the 2012 WEFTEC Conference in New Orleans about operator training and training challenges as one of a group of speakers on this subject. This perspective article summarizes that half-hour discussion in which he took part with his peers.

Over the past several years, perhaps due to the nation's financial and fiscal crisis, I have seen a marked decrease in students, trainees and operators at our training events at the University of Florida's TREEO Center.

can now only provide online training where the operators incur no travel expenses.

- We have no training money OR travel money; the operators are on their own to get the CEUs required to renew their licenses.
- We have training money, but no travel budget. We will pay the course fee; the operators must endure the travel expenses.

In some instances, this situation has caused operators to attend classes where they have taken time off to do so and used their own vehicles and savings.

MORE WITH LESS?

With less staff, there is less available time for operators to attend classes. Many of our local operators can only attend evening or weekends classes. At many utilities, positions are not being filled after some operators retire. This is causing real concern among the trainers and human resource departments: Who will we get to fill these positions?

Over the last several years, I have seen an increase in people willing to join the water and wastewater industry as a second career. Some are leaving other industries to join ours due to the economy, rising fuel costs, and downsizing. I get many people from the real estate workforce, the trucking industry, and the military asking how to get jobs in the water-wastewater field.

It's wonderful that we have folks willing and able to join the field, but how long will they be working in this job? How do we get young folks right out of high school, who do not long for a college education, to become water and wastewater operators?

In the accompanying table provided by the Florida Department of Environmental Protection's Operator Certification Program, you can see the evidence. More than 63 percent of the drinking water and wastewater operators in Florida are between the ages of 41 and 60, and fewer than 5 percent under the age of 30.

TECHNICALLY ADVANCED PLANTS

Keeping up with the times couldn't be more important than right now. Gone are the good old days of simple-to-control treatment units, where we just ran DO tests, settleometers, chlorine residual and pH tests. With the U.S. EPA facing litigation from environmental groups demanding stricter effluent discharge limits, our jobs have become more intense and advanced.

Facilities having to meet very low nitrogen and phosphorus limits require operators with more knowledge of the biological processes and training on how to make process control adjustments and run nutrient analysis. Today's treatment plants have nicknames like: MBR, MBBR, SBR, Anammox process, the Sharon process, the Bardenpho process, Bio-Denipho and Bio-Denitro.

Age of Licensed Operators...

DW/WW only 1/11/2013			DS only 1/11/2013		
Active License Holders 51.0 yrs. old is the Average			Active License Holders 49.0 yrs. old is the Average		
Age Bracket*	# of Licensee's	Overall %	Age Bracket*	# of Licensee's	Overall %
30 & younger	336	4.12%	30 & younger	326	8.79%
31-40	1028	12.62%	31-40	726	19.57%
41-50	2062	25.30%	41-50	1164	31.37%
51-60	3108	38.14%	51-60	1173	31.62%
61-70	1472	18.06%	61-70	310	8.36%
71-80	127	1.56%	71-80	9	0.24%
81 & older	16	0.20%	81 & older	2	0.05%
8149			3710		

* This does not represent 100% of all licenses. Some records do not have a DOB.

Focus on Change 2013! 5

DATA PROVIDED BY RONALD McCULLEY, FDEP OCP SECTION MANAGER
DW/WW only: Drinking Water and Wastewater Operator Licenses only
DS only: Water Distribution System Operator Licenses only

Granted, we are not the least expensive training vendor in Florida, but even our most loyal customers had slowed their attendance. When asked, plant managers, superintendents and operators usually cited one of these reasons:

- We only have money budgeted to cover the CEU training required for our operators. If an operator already had enough CEUs, the budget was used for others who did not.
- We have training money but cannot travel to your location. We

Why don't we have a uniform base test administered in every state, covering the basic topics of treatment plant operation: safety, maintenance, general chemistry and biological theory, disinfection, basic math and EPA regulations?

Many plants are computer-controlled, with relays, programmable logic controllers (PLCs) and automated valves. Troubleshooting these devices requires knowledge of electronics, instrumentation and 4-20 mA signals. If a valve opens at the incorrect time, or does not shut properly or fully, the whole treatment process can suffer, and so will effluent quality.

ONLINE VS. CLASSROOM

Today, online training opportunities exist like never before. Operators can take online courses to obtain their required CEUs, get training on almost any topic imaginable, and even take courses required to sit for state exams. In very unofficial studies in my classes at the TREEO Center, I ask participants about the online training they have taken and their thoughts on the material.

Just about 9 out of 10 people say that they prefer classroom teaching. Most of them cite the inability to feel a part of the training during online sessions, the monotony of sitting at a computer for hours, and the inability to do hands-on activities. However some prefer the online method due to convenience, the absence of travel, the ability to start and stop the training at will, and the cost savings. I find it interesting that the folks who prefer online training are younger (generally under 30). My concerns about online training, including webinars, are:

Who is validating the course material?

- Who wrote the course material: trainer or vendor/manufacture?
- Is the operator really the person at the computer logging the time for the class and CEUs?
- How do we confirm that the training, once completed, is really comprehended?

DISTRACTED OPERATORS

As a trainer, I see today's operators doing much more with less time and sometimes less money. They carry cellphones, smartphones, two-way radios, laptops and various other devices. Many times, they need these devices to stay in communication with the high-tech treatment plants they operate. During training sessions, trainers must compete for the attention of distracted operators who can quickly look up any topic on a smartphone during the class.

Operators receive text messages, emails and phone calls during class, distracting them and those around them from the material being presented. I remind many students to turn off their phones, but this becomes a problem if they need to use the smartphone as a calculator. I always keep generic calculators close by for such occasions!

GREAT QUESTIONS!

At the end of my speaking time during WEFTEC, I asked for questions from the audience. I was pleased to get several great ones. One question was: "How can we get more young people into this field?" My reply: We need to get out there and get our industry noticed! We are terrible at marketing ourselves and what we do.

Wastewater and drinking water operators seem to be behind-the-scenes people, doing our jobs every day, often unnoticed. We need to reach out to vocational-technical school representatives and high school guidance counselors, attend local job fairs at schools, go to malls and workforce centers. *TPO* magazine has had many articles about people who are doing all of this with their local schools and community colleges. We need to let people know that we are in a highly technical field that the human race cannot live without.

Another good question was about "reciprocity in licensing between the states, to allow more flow between the states operators?" My reply:

(Continued on page 51)

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CST Storage receives Canadian Welding Bureau certification

CST Storage received Canadian Welding Bureau certification, enabling it to provide welded structures in Canada that are certified to meet Level 2 of the Canadian welding code.

Vortab offers flow conditioning brochure

The Vortab Co. offers a brochure for plant, process and instrumentation engineers on flow conditioning devices that improve the performance, accuracy and repeatability of flowmeters and other flow profile critical process equipment. The brochure is available for download at www.vortab.com.



Miox receives ISO certification

Miox Corp. received ISO 9001:2008 certification. MIOX designs and manufactures equipment that generates oxidant-based chemicals on demand.

Niagara Blower acquires new headquarters facility

Niagara Blower acquired the 100,000-square-foot manufacturing and office facility and adjacent property at 91 Sawyer Ave., Tonawanda, N.Y. The vacant building will become the new world headquarters for Niagara and subsidiary company Kathabar Dehumidification Systems.

PSG names director of engineering, business development

Pump Solutions Group named Chris Distaso director of engineering and Greg Duncan senior director of business development. Distaso will be responsible for the supervision and management of the company's research and development. As a member of PSG's leadership team in Grand Terrace, Calif., Duncan will be responsible for leading the organization's growth and profitability efforts.



Chris Distaso



Greg Duncan

Vogelsang names Holtz national sales manager

Vogelsang USA, manufacturer of pumps, grinders and related equipment for the municipal, industrial and agricultural markets, named Scott Holtz national sales manager. He will be responsible for managing sales for North America, overseeing the development of short- and long-term sales strategies, and developing and implementing the company's annual sales plan.

Rhino Linings celebrates quarter century

Rhino Linings Corp., manufacturer and distributor of industrial protective coatings, specialty epoxies and spray foams, celebrates 25 years of equipment protection in 2013.

SJE-Rhombus adds sales manager, representative

SJE-Rhombus hired Tim Callander as regional sales manager for its wholesale controls product line. He will support customers in Mid-America from Texas to Canada. The company also named Dalcart & Associates as its product representative in Colorado and Wyoming.



Tim Callander

Xylem's Dallas facility receives ISO certification

Xylem's Dallas facility received ISO 9001:2008 certification. The plant designs and manufactures packaged pumping systems, controls and RO treatment systems for municipal, residential, commercial and industrial applications. The ISO audit was performed by Det Norske Veritas.

WesTech names municipal water unit leader

WesTech Engineering named Les Uhlmeier leader of its Municipal Water Treatment Unit, overseeing the Microfloc and General Filter product lines. He has 30 years experience in the water treatment industry.



Les Uhlmeier

Woodard & Curran names Guttenplan to board of directors

Woodard & Curran, an integrated engineering, science and operations company, named Steve Guttenplan to its board of directors. He is the former president of Metcalf & Eddy/AECOM and global chief technology officer and executive vice president for AECOM Water.

Danfoss launches product website

Danfoss, manufacturer of high-efficiency electronic and mechanical components launched DanfossDirect (www.danfossdirect.com). The site enables users to search for fluid controls by application, industry or type.

UV Pure releases water technology video

UV Pure Technologies released its Crossfire Technology water technology video at www.uvpure.com/crossfire/?ap=y.

KROHNE offers Web-based training

KROHNE offers Web-based training on measurement technologies through its KROHNE academy. The audio-enhanced, interactive courses focus on either a measurement technology, such as variable area, vortex, ultrasonic or mass flow, or general topics, such as the basics of gas measurement or pipeline leak detection. Training is free and is not specific to individual products and/or industries.

Chemineer launches website

Chemineer launched a new interactive website, www.chemineer.com. The site provides information on the company's design and manufacture of standard and custom fluid agitation equipment and systems.



Passavant-Geiger acquires Johnson Screens

Passavant-Geiger, a wholly-owned subsidiary of Bilfinger SE, acquired Johnson Screens. Based in New Brighton, Minn., Johnson manufactures mechanical components for the separation of solids from liquids and gases and offers related services from 11 locations worldwide. The products are used for the extraction and treatment of drinking water, wastewater and refining applications for the oil and gas industry.

Mazzei names director of analysis and VP of development

Mazzei Injector Co. named Dr. Sri Pathapati director of CFD analysis and engineering and Celia Cobar vice president of research and development.

Industrial Safety acquires Simtronics

Industrial Safety Technologies acquired Simtronics AS, based in Oslo, Norway, and Simtronics SAS, based in Aubagne, France. Simtronics produces and installs gas and flame detection systems.

NETZSCH Pumps names regional manager

NETZSCH Pumps North America named Jan Torrellas regional sales manager for the Southwest Region of the United States. Based in Houston, Texas, he is responsible for supporting industrial and municipal distributors in Arkansas, Texas, Oklahoma, Louisiana, Mississippi and western Tennessee.

(Continued from page 49)

I believe it's time we all come together and form a nationwide licensing board for water and wastewater operators. So many of our states require course work to sit for an exam, and the most common courses used are the tried-and-true California State University Sacramento Office of Water Program's courses on Operation of Wastewater Treatment Facilities (Vols. 1 and 2) and the Advanced Waste Treatment course.

Since this material is the main training source, why can't we make that our reference manual for the exams, pull questions from them, and build a set of exams that would be uniform around the country?

The Association of Boards of Certification (ABC) licensing program has a table that shows reciprocity between their licensing and 36 states, territories and tribal agencies. It can be found at www.abccert.org/abc_certification_program/exam_equivalency.asp.

My thought on this issue is: Why don't we have a uniform base test administered in every state, covering the basic topics of treatment plant operation: safety, maintenance, general chemistry and biological theory, disinfection, basic math and EPA regulations?

On passing that basic exam, trainees could take specialized exams for the types of treatment in which they wanted endorsement: activated sludge, trickling filters, nutrient removal and others. The same could apply in the drinking water industry. An operator who wanted to move to Montana or California or Florida could then take a specialized exam covering treatment techniques used in that state or locale. I believe this would make us more valuable and marketable as operators and increase our pride and professionalism.

I hope this perspective generates some interest and discussion. Let me know if you find yourself saying, "Yes, that's what is happening to my utility, or in my workplace, or during my training sessions."

ABOUT THE AUTHOR

Ron Trygar is senior training specialist in water and wastewater at the University of Florida TREEO Center and a certified environmental trainer (CET). He can be reached at rtrygar@treeo.ufl.edu. tpo

American Water names CFO

American Water Works Co. named Susan N. Story chief financial officer. She succeeds Ellen Wolf who retired in January. Story has 30 years of utility experience.



Susan N. Story

GLV Group's Ovivo receives \$85 million contract

Ovivo, operating water treatment sector for Canadian-based GLV Group, signed three contracts for \$85 million in the electronics market segment. Work includes the design, supply and commissioning of advanced ultrapure water as well as industrial process and wastewater systems in Asia and North America.

Xylem offers water removal, flood control app

A mobile app of the *Xylem Dewatering Handbook* from Xylem provides users with access to dewatering, water removal and flood control pump product information from the company's Flygt and Godwin brands. The app is available for download from the iTunes App Store. <https://itunes.apple.com/app/xylem-dewatering/id582035365?mt=8>. tpo



TECHNOLOGY FOR TREATING WATER AND EXHAUST GASES FOR MUNICIPALITIES AND INDUSTRIES



EXHAUST GASES: Particulates, NO_x, SO_x, Organics, Odors

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OBJECTIVES: Meet Clean Air Act Requirements, Water Discharge Limits, Recycle Water Low Investment and Operating Costs, "Green" Technologies; No Natural Gas Consumption; Eliminate Odors

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Odor Control and Disinfection

By Craig Mandli

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InLine+ series of UV disinfection systems from Aquionics



Ecosorb vapor phase delivery systems from OMI Industries

VAPOR PHASE DELIVERY SYSTEM

Ecosorb vapor phase delivery systems from OMI Industries provide an environmentally friendly option for delivery of odor control products in dry mist form. They are simple to install, operate and maintain and require no nozzle maintenance, water, mixing or dilution. The technology uses a blend of natural ingredients to eliminate industrial odors without chemicals or masking fragrances. A programmable logic controller-based touch screen lets users set auto sequence startup, see real-time airflow rates, and control liquid flow. An alarm panel alerts users to issues such as low fluid and pressure levels. Options include a wind direction optimizer, remote access and control options, freeze protection for outdoor installations, and alternate voltage. **800/662-6367; www.omi-industries.com.**

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The Bio-Wheel fixed-film aerator from H2O Innovation is an alternative to blowers for activated sludge processes. Air is trapped within the wheel plates and slowly released as the wheel turns. The wheel also provides surface area for fixed-film growth to promote the proliferation of high SRT bacteria on the film. The result is a low-energy, versatile integrated fixed-film/activated sludge (IFAS) process that can be used for greenfield or retrofit applications. The suspended growth allows operational flexibility through the adjustment of mixed liquor suspended solids concentrations, while fixed film protects the biomass from shock loads and facilitates removal of difficult-to-degrade compounds while reducing sludge production. **888/688-0170; www.h2oinnovation.com.**



Bio-Wheel fixed-film aerator from H2O Innovation

BAGGING SYSTEM



Longofill continuous bag system by Paxxo

The Longofill continuous bag system by Paxxo can connect to the discharge point of machines used to move, dewater or compact screenings and grit, which are then deposited in a continuous bag for odor containment and spillage control. The cassette is easy to seal, and the material and odors are trapped inside, reducing environmental and health issues and curtailing development of bacteria and fungus spores. **770/502-0055; www.paxxo.com.**

METERING PUMP

The Pulsafeeder manual-control metering pump from Cole-Parmer offers reliable metering with guided dual check valves for precise seating and priming and suction lift. It is water-resistant and can be installed outdoors. It offers an adjustable stroke rate and length, reliable timing circuits, and circuit protection from voltage and current upsets. Leak-free bleed valves provide safe and easy priming. **800/323-4340; www.coleparmer.com.**



Pulsafeeder metering pump from Cole-Parmer



Modular diffusers from Diffused Gas Technologies

CERAMIC DIFFUSERS

Modular diffusers from Diffused Gas Technologies include a ceramic matrix and ozone-compatible gasketing. They use aluminum oxide ceramic matrixes fused at ultra-high temperatures and are nested in bases fabricated of #316 stainless steel. To assure proper sealing between parts made from different materials, gaskets such as Hypalon, Viton, or PTFE are used. They use a standard 3/4-inch male connection. **513/934-4418; www.diffusedgas.com.**

CHLORINE AND SODIUM HYPOCHLORITE PLANT

The Klorigen chlorine and sodium hypochlorite plant from Electrolytic Technologies Corp. provides production rates from 150 to 40,000 pounds per day of chlorine as gas or bleach. It uses NSF/ANSI Standard 61 materials. The sodium hypochlorite generated has low chlorate levels and meets NSF/ANSI Standard 60 requirements. Nearly the entire system is shop-fabricated to allow pre-testing before shipment. Systems last more than five years and do not require acid cleaning. **305/655-2755; www.electrolytictechnologies.com.**



Klorigen chlorine and sodium hypochlorite plant from Electrolytic Technologies Corp.



Amalgam system from Engineered Treatment Systems

CLOSED-VESSEL UV SYSTEM

The 800-watt Amalgam system from Engineered Treatment Systems uses an 800-watt UV disinfection lamp to prevent the growth of algae. The system uses advanced wipers to keep the optical path free from fouling. Validated UV sensors provide real-time dose level feedback. Hatches allow access to the chamber for annual maintenance. **877/885-4628; www.ETS-UV.com.**



BIOTRICKLING FILTERS

The EcoFilter line of biotrickling filters from BioAir Solutions can remove more than 99.9 percent of hydrogen sulfide and more than 95 percent of total odors from collection system and wastewater treatment plant air streams. They provide process control over the critical factors of moisture content, pH and nutrients while using

no hazardous chemicals or consumables. They incorporate the company's EcoBase structured synthetic media,

EcoFilter biotrickling filters from BioAir Solutions

which delivers consistent performance across the media bed throughout the system's 20-plus-year lifespan. **856/258-6969; www.bioair-solutions.com.**

SUPERSATURATED DISSOLVED OXYGEN SYSTEM

The SDOX-CS supersaturated dissolved oxygen system from BlueInGreen delivers dissolved oxygen within the gravity sewer or force main. The two key design parameters are oxygen uptake rate and oxygen requirements for sulfide oxidation. The system can eliminate odors in pressurized full-flow pipelines and in gravity sewers. H_2S elimination also mitigates corrosion. The system can replace chemicals and their downstream byproducts. **479/527-6378; www.blueingreen.com.**



SDOX-CS dissolved oxygen system from BlueInGreen



PTG X-500 from Pasteurization Technology Group

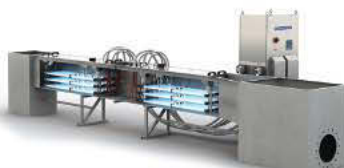
WASTEWATER DISINFECTION SYSTEM

The PTG X-500 from Pasteurization Technology Group combines sustainable wastewater disinfection with renewable energy generation. The integrated system can use biogas, biomass or natural gas to power a turbine or engine that

generates electricity. The exhaust air is passed through a waste heat recovery unit that increases the temperature to disinfect the wastewater. Intelligent software optimizes energy usage. The system uses no toxic chemicals, electricity or UV lamps. **510/357-0562; www.pastechgroup.com.**

SMART UV SYSTEM

The TAK 55 Smart UV system from WEDECO – a Xylem Brand, makes the disinfection of low wastewater flows easy and cost-effective without any compromise in quality or flexibility. Equipped with ECORAY low-pressure high-intensity (Lo-Hi) UV lamps and ballasts, the system provides reliable performance while minimizing energy consumption. The system has been extensively tested in line with the recently published IUVA protocol for the disinfection of secondary treated effluents. It even meets the most stringent validation requirements as outlined in the US EPA UVDGM 2006. **704/409-9700; www.wedeco.com/us.**



TAK 55 Smart UV system from WEDECO – a Xylem Brand

(continued)

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BIO ENERGIZER from Probiotic Solutions is a micro carbon complex used in municipal and industrial systems to reduce sludge, odor, BOD/COD, FOG, operational upsets, and costs in treatment plants and lagoons. It biochemically oxidizes sludge in wastewater and reduces the lagoon sludge blanket without draining, drying, dredging, handling or hauling. When used in activated sludge plants, it increases volatile solids destruction and improves decant volume and settleability, enhancing digester and reactor capacity. 800/961-1220; www.probiotic.com.



BIO ENERGIZER from Probiotic Solutions



Granular activated carbon (GAC) pressure filters from WesTech Engineering

CARBON PRESSURE FILTER

Granular activated carbon (GAC) pressure filters from WesTech Engineering are an effective means for removal of low-molecular-weight contaminants from aqueous solutions. They are suited for the removal of dissolved organic compounds responsible for poor taste and odor in drinking water, as well as removal of chlorine from industrial waters. They

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utilize a pressure vessel, typically with a conical underdrain for convenient GAC media replacement. They are sized according to the contact time required for contaminant removal and desired media replacement frequency. 801/265-1000; www.westech-inc.com.

PERACETIC ACID MICROBIOCIDAL

Proxitane WW-12 Peracetic Acid (PAA) microbiocide from Solvay Chemicals provides biological control in municipal wastewaters. An alternative to halogenated disinfectants, it does not generate disinfection byproducts even if overdosed. It can be retrofitted to or work in series with existing disinfection systems. Tests show initial fecal coliform counts reduced tenfold within the first 8 to 10 minutes of estimated residence time after contact. All PAA was consumed before discharge, demonstrating lack of persistence. 800/765-8292; www.solvaychemicals.us.



Proxitane WW-12 Peracetic Acid (PAA) microbiocide from Solvay Chemicals



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REPLACEMENT UV LAMPS

UV Superstore offers direct replacement UV lamps for most disinfection systems in wastewater treatment plants. The lamps meet or exceed OEM specifications. 770/307-3882; www.uvsuperstore.com.

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Sludge Eater from Misty Mountain is a blend of organic waste-eating bacteria and barley that helps control green water and string debris. It includes heterotrophic/heterogeny enzyme-producing bacteria blended for heavy organic loads and can be used in many applications. It is non-toxic and non-pathogenic and feeds on decomposing organic matter. The barley naturally controls string debris and allows the bacteria to further decompose it. 800/493-0564; www.mistymountainkoi.com. tpo



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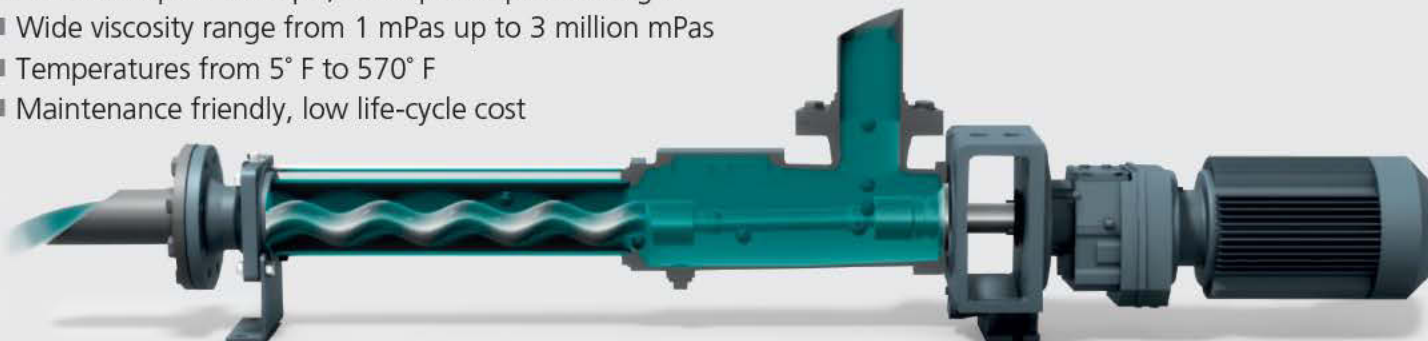
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By Scottie Dayton

Capture and treatment system controls odors

Problem

Residents in Bridgeport, Conn., complained of odors from a wastewater treatment facility.

Solution

The Water Pollution Control Authority selected **retractable covers and a carbon system from Geomembrane Technologies**. The durable coated fabric tensioned over low-profile aluminum arches covers the influent channel and primary clarifiers. The installation was done while the clarifiers were in service.



RESULT

Odors were controlled and budgets were met. 506/449-0993; www.gticovers.com.

Odor control system saves money

Problem

Structural failures in the chemical scrubbing odor control system at the Swansea Wastewater Treatment Plant in West Glamorgan, U.K., required operators to enter areas of the building wearing full breathing apparatus. The estimated cost for replacing the equipment was \$2 million.

Solution

Welsh Water, the company operating and maintaining the facility, installed the **Terminodour system from Kusters Water/CSO Technik** in a pilot program. Seeing its low cost, simple retrofit and efficiency, the company made the selection permanent.



RESULT

The system saved the plant more than \$1 million in capital expenditures. Operating expenses declined, and operators noticed a significant reduction in hydrogen sulfide corrosion. 205/987-8976; www.kusterswater.com.

Solar-powered mixers eliminate odors

Problem

Every spring, residents noticed odors from the seven lagoons at the Garretson (S.D.) Wastewater Treatment Plant. The containment system totals 35.2 surface acres and 46.8 million gallons, but the lagoons are only 5 feet deep.

Solution

SolarBee engineers recommended a solar-powered mixer from Medora Corp. for each of two lagoons. The units mix and oxygenate the top 3 feet of water, oxidizing sulfide gas to non-odorous sulfate. Constant circulation also removes surface film, allowing methane to escape more easily and increasing anaerobic digestion to reduce sludge.



RESULT

The mixers have been installed for five years. "We don't detect any odors in spring anymore," says utilities superintendent Craig Nussbaum. 866/437-8076; www.medoraco.com.

Mixing system manages pump station grease

Problem

The 1.5 mgd RCA Pump Station in Deptford, N.J., had FOG and odor problems. The Municipal Utilities Authority increased pump-outs from twice a year to quarterly at a cost of \$600 per load, but that wasn't often enough. Operators failed to control the odor with deodorizers and enzymes. Assistant superintendent Mike Cusick searched for solutions.

Solution

The authority purchased a **PHI 300 Big Bubble mixer with two bubble-forming plates from Pulsed Hydraulics**. After the plates were installed on the floor of the well, an electro-pneumatic valve that opened and closed in milliseconds released a massive, well-formed bubble every 30 seconds. The air burst powered liquid and sediment off the bottom, forcing them upward to smash into the grease. As the shock waves broke up the blanket, bubbles began breaking the surface, moving liquid and solids tangentially to the walls and down the sides to the bottom to complete the mixing cycle.

RESULT

The grease and odors were gone within a week and did not return. Annual savings in disposal fees provided a three-year return on investment. **800/641-1726; www.phiwater.com.**



Closed-vessel UV system enables water reuse

Problem

An amendment to the Lahontan Region Basin Plan allowed recycled water for outdoor irrigation at elevations above 3,200 feet. The Grass Valley Wastewater Treatment Plant in Lake Arrowhead, Calif., needed an upgrade to comply with limits set on disinfection byproducts and residuals.

Solution

The plant installed four closed-vessel **TrojanUVFit 32AL50 reactors** (two are redundant). The reactor is approved for Title 22 applications by the California Department of Public Health and validated in accordance to the UV Disinfection Guidelines for Drinking Water and Water Reuse. A UV intensity sensor monitors output and ensures adequate dosing to optimize energy usage. The energy-efficient, affordable reactors have a small footprint.

RESULT

The reactors enabled the treated effluent to be used for irrigation. **519/457-3400; www.trojanuv.com.**



Expansion project includes odor control system

Problem

An expansion project at the Wyoming (Mich.) Clean Water Plant required a new odor control solution.

Solution

Engineers chose truss-supported, **extruded flat aluminum covers from CST Covers** (formerly Conservatek and Temcor). They were installed on three biosolids storage tanks and four primary settling tanks. The settling tanks had open-top flow-splitting chambers with non-standard railings and manlift sockets at access hatches.

RESULT

The covers' weight-bearing abilities gave operators a slip-resistant walkway. The project allotted 12 months for completion and was finished in nine. "The product's design allowed us to use less labor and finish ahead of schedule," says maintenance supervisor Tom Wilson. **936/539-1747; www.cstcovers.com.**



Biofilter system reduces odor detection thresholds

Problem

Sanitation District #1 in Covington, Ky., a fast-growing area, was receiving odor complaints from its biosolids treatment system. The plant is in a valley, and the biosolids emitted intensely odorous gases. The problem could not be resolved by incinerating or chemically treating the gases.

Solution

The municipality contracted with **PRD Tech to install a twin-biofilter system** consisting of two vessels connected in series. Gas flows going down through one unit and then up through the other. Each biofilter is 14 feet in diameter and 20 feet high, with a gas residence time of 15 seconds. The biomedica has a large surface area and is randomly packed. It can be washed down automatically based on the gas-phase pressure drop across the biofilter beds, enabling the system to handle large loads of inlet volatile organics, which would clog a packed bed due to biomass growth.

RESULT

The system effectively removed odorous gases from the airstream, and odor complaints were nearly eliminated. **513/673-3583; www.prdtechinc.com. tpomag.com**





1. BEL-ART TEST TUBE RACK

The Scienceware Switch-Grid test tube rack from Bel-Art Products stores up to two sizes of tubes at the same time with 25 possible tube size combinations in one rack. Each rack is divided into two sides enabling the same or different size tube grids to be used on each side. The removable grids are available in five color-coded sizes to fit tubes from 10 to 30 mm. **800/423-5278; www.belart.com.**

2. INDUSTRIAL SCIENTIFIC TANGO GAS MONITOR

The Tango TX1 single gas monitor from Industrial Scientific detects carbon monoxide, hydrogen sulfide, sulfur dioxide and nitrogen dioxide. Features include DualSense technology for increased worker safety regardless of bump test frequency. The monitor is powered by one replaceable 2/3 AA lithium battery for up to three years of continuous operation. **800/338-3287; www.indsci.com.**

3. HAYWARD FLOW CONTROL PNEUMATIC ACTUATORS

The GF-PP (glass-filled polypropylene) PMD4/PMS4 series of pneumatic actuators from Hayward Flow Control feature a corrosion-resistant housing and are available in several sizes for use with Hayward ball valves up through 6 inches and butterfly valves through 4 inches. Available in double-acting and spring-return designs, the PMD4 actuator has a torque range at 80 psi of 125 inch-lbs to 500 inch-lbs. The PMS4 actuator has a

range of 44 inch-lbs to 230 inch-lbs. All sizes have NAMUR VDI/VDE 3845 mounting for solenoids and ISO5211 mounting base. **888/429-4635; www.haywardflowcontrol.com.**

4. INDUSOFT SCADA VISUALIZATION APP

The SCADA visualization app for Windows 8 and Windows RT from InduSoft provides mobile access to SCADA information from a variety of mobile access stations, including iPhones, tablets and laptops. **877/463-8763; www.indusoft.com.**

5. GMI 5-WAY GAS DETECTOR CHARGER

The PS200 5-way charger from GMI (Gas Measurement Instruments) holds up to five portable gas detectors. It can be placed on flat ground or mounted to a wall. Features include a universal power supply and short circuit protection. Maximum charge time is less than four hours. **713/559-9290; www.gmiusa.com.**

6. FORCE FLOW POLYMER FEED MONITOR

The Tote Bin Scale polymer feed monitor from Force Flow enables operators to monitor the amount of polymer being fed from IBC type totes for dewatering. The unit remotely monitors from SCADA via 4-20mA or RS485 signals. Day tank and drum scales are available for other polymer tank styles. **800/893-6723; www.forceflow.com.**

7. GRUNDFOS HIGH-EFFICIENCY CIRCULATOR PUMP

The MAGNA3 high-efficiency circulator pump from Grundfos Pumps, designed for commercial hydronic applications, cuts power consumption by 85 percent through its AutoAdapt function that automatically and continuously adjusts circular performance and FlowAdapt control mode that reduces the need for pump throttling valves. Other features include a carbon fiber reinforced composite rotor can that seals fluid from the stator motor, differential pressure sensor, constant temperature mode, on-pump TFT display and rotating power head. The pump handles temperatures down to 15 degrees F and has a maximum head of approximately 60 feet and maximum flow of approximately 570 gpm. **800/921-7867; <http://us.grundfos.com>.**

8. BILCO AUTOMATIC FIRE VENT

The Lumivent automatic fire vent from The Bilco Co. features multi-wall polycarbonate covers that provide natural daylighting and pitched cover design to meet UL 793 and 2012 IBC 2610.3 building code requirements. The sloped design encourages burning embers to roll off the covers rather than burn through. **203/934-6363; www.bilco.com.**

9. CAIG BARRIER HAND LOTION

Hand-E-Glove barrier hand lotion from CAIG Laboratories is applied before beginning tasks for soap-and-water cleanup and keeps skin from drying and cracking when applied under work gloves. **858/486-8388; www.caig.com.**

10. HOYT POWER AND ENERGY METER

The Watt Dog power and energy meter from Hoyt Monitor Technologies features a touch-screen graphical display and is available with USB and Ethernet interface, WattVIEW or WattVIEW Reporter software package and custom-configured drivers. The meter, upon demand, downloads measured results for reporting and analysis. The primary screen provides energy, power and dollar information. Secondary screens can be tailored to display historic data, demand energy profiles or any measured parameter. **800/258-3652; www.hoytmeter.com.**

11. HAMMOND POLYCARBONATE ENCLOSURES

The PCJ Series of polycarbonate enclosures from Hammond Manufacturing Co. are designed for installations where NEMA 4X (IP66) environmental sealing for dust and water is required. The screw-down cover versions meet NEMA 6P sealing requirements. Sizes range from 5.93 by 6.16 by 4.91 inches to 13.94 by 12.16 by 10.82 inches. The basic enclosure is available in 80 different configurations. **519/822-2960; www.hammondmfg.com.**

12. BLUE-WHITE DIAPHRAGM METERING PUMP

The Chem-Pro 2 diaphragm metering pump from Blue-White Industries has a remote start/stop, optional 4-20mA output, upgradable firmware, single-piece junction box, maximum feed rate of 20.3 gph, maximum pressure of 175 psi and 166 rpm maximum strokes per minute. Other features include double ball valves, built-in priming/degassing valve, built-in diaphragm failure detection system for leak detection and NEMA 4X housing. **714/893-8529; www.blue-white.com.**

13. HACH WIMS VERSION 7.4

Water Information Management Solution version 7.4 from Hach is designed for water and wastewater utilities. The software platform provides enhancements for Windows 8 and iPad touch-screen use, one-click reports and additional electronic reporting capabilities. Reports include Hach SCADA cross reference, LIMS cross reference, data change and compliance status. **800/368-2723; www.hachflow.com.**

14. KAESER COM-PAK BLOWERS

Model BBC and FBC Com-pak blowers from Kaeser Compressors cover

product spotlight

Biological Air Treater (BAT) attacks plant odors

By Ted J. Rulseh

The Biological Air Treater (BAT) from Purafil is designed to minimize odors from wastewater treatment plants, composting sites and wastewater lift stations by using a combination of biological and dry odor-control technologies.

The BAT system provides efficient and cost-effective odor abatement and volatile organic chemical (VOC) treatment, according to Don Apking, sales manager for North American wastewater. "We created this product because in treating hydrogen sulfide odor, dry media systems top out at concentrations of 30 to 40 parts per million," Apking says. "Removal of higher concentrations requires a biofilter."

The system's proprietary technology is provided through an exclusive license with Honeywell Process Solutions. The media consists of blends of specially formulated foam cubes and spacers, supported for immobilized bio-catalysts. The cubes provide high surface area per unit volume to host microbial biofilms, while the spacers supply substantial void volume and structural integrity for tall beds, as well as enhanced mass transfer and effective hydraulic dispersion and distribution.

The proprietary mixed-media support enables control of surface area and void space, reducing pressure drops across the bed. Foam-to-plastic ratios vary with engineering design and application and are used to control biofilm depth and pressure drop. BAT mixed-media beds can be used in biofilters to produce highly efficient bulk removal, intermediate removal, and polishing zones.

For polishing filtration, the system includes Purafil Odormix SP dry media, engineered to maximize the amount of permanganate active ingredient, increasing capacity without off-gassing. The media displays high working capacity for broad-spectrum oxidation of contaminants in field conditions, where multiple gases may be present.

The total system offers a compact footprint, low capital and operating costs, long media life, and ease of operation with stable biofilms that resist fluctuations. It removes pollutants including hydrogen sulfide and ammonia; hydrocarbons; sulfuric acids such as mercaptans; and nitrogenous compounds like trimethylamine, amides and nitriles; as well as aromatics and aliphatics. **800/222-6367; www.purafil.com.**



Biological Air Treater (BAT) from Purafil

3 to 175 hp and are designed, built and tested to meet international and domestic performance and safety standards. Units are available in both STC (wye-delta start) and OFC (variable-frequency drive) versions. Other features include Sigma Control 2 with Omega Control software. **877/596-7138; www.kaeser.com.**

(continued)



15. PROMATION ENGINEERING LINEAR ACTUATORS

PL Series electric linear actuators from Promotion Engineering provide up to 4,400 pounds of force and up to 3.9 inches of travel. Features include field-selectable travel stops, on/off/floating/proportional control, customizable mounting system, manual override and standard voltages. The actuators are compatible with 24VAC, 24VDC, 120VAC and 230VAC power supplies. **352/544-8436; www.promotionci.com.**

16. RIDGID ABS, FOAM-CORE PVC PIPE CUTTERS

FC-Cutters from RIDGID are designed to cut ABS and foam-core PVC pipe. Available in two options for cutting 1 1/2- and 2-inch-diameter pipe, the cutters feature an extended handle for leverage and one-rotation cuts that don't leave burrs. **800/769-7743; www.ridgid.com.**

17. SIEMON ANGLED HD PATCH PANEL

Angled HD patch panels from Siemon are available in 24- and 48-port versions in both Category 5e and Category 6. Features include a write-on area for panel and port identification on both the front and rear of the panel, as well as a front surface uninterrupted by screw heads. Category 5e panels use S110 termination modules and Category 6 panels use S310 termination modules with pyramid wire entry. **860/945-4200; www.siemon.com.**

18. SPIRE PORTABLE BTU METER

The Regal Series RH40 portable ultrasonic Btu meter from Spire Metering Technology, formerly Shenitech, is designed to deliver non-intrusive Btu and flow measurement across an array of pipe sizes and various liquids in heating/cooling applications. The 1-pound, hand-held meter uses clamp-on sensors to measure flow, temperature and heat energy/Btu consumption on pipes from 0.5 to 120 inches in diameter. **888/738-0188; www.spiremt.com.**

FORTTRANS GAS INFUSION AERATOR

The Dif-Jet gas infusion aeration device from Fortrans infuses oxygen from air or pure oxygen into wastewater, achieving 90 to 95 percent dissolved oxygen. Typically, no filters are required prior to infusion. The device reduces chemical oxygen demand and biological demand levels and eliminates COD and BOD surcharges from municipal wastewater treatment plants. The scalable device can be incorporated into existing treatment systems and is available in PVC and stainless steel designs. **866/958-7267; www.fortransinc.com/aerators.**



19. TB WOOD'S ONLINE COUPLING SELECTOR

The Sure-Flex and Dura-Flex online coupling selector from TB Wood's, available at www.tbwoods.com/coupling-selector.asp, enables users to select the correct coupling for a specific application. Sure-Flex couplings utilize a rubber (EPDM), neoprene or Hytrel sleeve. Four-way flexing action absorbs shock, misalignment and end float. **717/267-2900; www.tbwoods.com.**

20. NEPTUNE DIAPHRAGM METERING PUMP

The Series 7000 mechanically actuated diaphragm metering pump from the Neptune Chemical Pump Co. is designed for challenging water and wastewater applications. The pump eliminates the use of contour plates on the liquid side of the diaphragm, while the straight-through valve and head design allows for improved flow. The self-priming pump has a maximum capacity of 300 gph at 150 psi. **215/699-8700; www.neptune1.com.**

21. RUSSELECTRIC POWER CONTROL SYSTEMS

On-site power control systems from Russelectric are equipped with dual PLC controls for automatic generator set starting and stopping, status and alarm annunciation, synchronizing and priority load control. A primary PLC control system operation with a backup PLC running the same program as the primary. If the primary fails, the backup PLC assumes operational control. If both PLCs were to fail, a manual control allows operating personnel to synchronize and parallel the generators onto the bus, as well as to add and shed load. **800/225-5250; www.russelectric.com.**

22. OLDHAM FIXED GAS MONITOR

The iTrans fixed gas monitor from Oldham, an Industrial Scientific company, is compatible with WX and MX43 Series controllers. Features include an intelligent electronics platform providing one or two points of detection from a single head. Other features include non-intrusive calibration, LED displays, programmable alarms and onboard sensor life indicators. **800/338-3287; www.oldhamgas.com.**

FLYGT 2600 DRAINAGE PUMP

The 2600 drainage pump series from Flygt, a Xylem Brand, is available in four models, ranging from 4 to 18 kW. Designed for water removal in harsh dewatering conditions, the pumps feature Xylem's DuraSpin hydraulic system, Hard-Iron impeller and plug-in cartridge seal. **704/409-9700; www.flygtus.com.**



23. PATLITE LED WORKLIGHTS

CLK Series LED worklights from Patlite feature micro-array lens technology for even light distribution and up to 2,100 lux. The lights maintain at least 70 percent of initial brightness for 60,000 hours of operation and have a slim profile aluminum or stainless steel body that resists water, oil and chemicals. **888/214-2580; www.patlite.com.**

24. SENSOREX FLUID MONITOR SENSORS

CS615 conductivity sensors from Sensorex Corp. monitor process fluids for changes. Made of 316 stainless steel, the sensor withstands cleaning in place and steam sterilization processes up to 266 degrees F. Two models are available for 1- to 1.5-inch and 2-inch tri clamp flanges. Both sizes come with optional automatic temperature compensation. **714/895-4344; www.sensorex.com.**

25. PEPPERL+FUCHS SURGE PROTECTION BARRIERS

M-LB Series surge protection barriers from Pepperl+Fuchs fit various configurations and protect 115/230-volt main power supplies against power surges. The pluggable and pre-wired protection modules can be mounted on DIN rails and feature front-side indicators that deliver at-a-glance operating state and error message outputs for quick and easy maintenance. The units are hot-swappable for in-the-field replacement without tools. **330/486-0002; www.pepperl-fuchs.us.**

26. TORCUP INDUSTRIAL TORQUE WRENCH

The Slimline Ratchet Link industrial torque wrench by TorcUP has a torque range of 395 ft-lbs to 3,950 ft-lbs for use on fasteners from 1 to 3 1/8 inches. The wrench fits in areas less than 1 inch wide. Powered by an electrically or pneumatically driven hydraulic pump, torque can be applied by one operator. **610/250-5800; www.torcup.com.**

27. SEEWATER ADJUSTABLE PUMP CONTROL

The piggyback sewage and sump pump control from SEewater has an adjustable pump run time switch for use in general dewatering, wastewater, sewage and confined space pumping applications. The control has a pump range of 10 seconds to hours. It can be used with a SEewater WS Series control panel or as a stand-alone control. **888/733-9283; www.seewaterinc.com.**

28. WILDEN AIR-OPERATED, DOUBLE-DIAPHRAGM PUMP

Air-operated, double-diaphragm pumps from Wilden, available in

metal (die-cast aluminum, stainless steel and alloy C) or plastic (polypropylene and PVDF), feature leak-free bolted construction for transferring fluids containing particulates or abrasive compounds. Pump sizes range from 1/4 to 3 inches, flow rates range from 4.4 to 264 gpm, and solids-handling ranges from 1/16 inch to 2 inches. **909/422-1730; www.wildenpump.com.**

29. OMEGA HAND-HELD DIP STRIP PHOTOMETERS

The lightweight HHWT-13 series of hand-held dip strip photometers from Omega Engineering are CE-compliant and use a 4 mL water sample. Designed for monitoring pH, features include three-button control, 140-test memory and automatic countdown test time. **800/826-6342; www.omega.com.**

30. LARSON FLEXIBLE UV LIGHT STAND

The WALCO4X24LED-UV portable ultraviolet LED light stand from Larson Electronics, equipped with wheels and dolly-style frame, features a series of flexible arms that can position each UV LED light head in multiple angles, heights and distances from the object being cured. The UV light head can reach up to 7 feet. The entire assembly can collapse to 4.5 feet for storage. The UV light cart has a 90-amp hour SLA battery, providing five hours of continuous operation on a single charge. **800/369-6671; www.magnalight.com.**

31. WALCHEM HAND-HELD FLUOROMETER

The Turner Designs Opti-Check fluorometer from Walchem, IWAKI America, ensures accurate calibration of the Little Dipper online fluorometer that measures and controls the concentration of scale or corrosion inhibitors in cooling tower and boiler applications. Available in PTSA and PTSA/Fluorescein versions, the hand-held meter features a watertight (IP 67) package and sensitivity to less than 1 ppb of fluorescent dye. **508/429-1110; www.walchem.com.**

PALMER WAHL INDUSTRIAL THERMOMETER

The Digi-Stem DST400 industrial thermocouple thermometer from Palmer Wahl is vibration-resistant and compatible with K, J, T, E or S thermocouples for use in temperatures from -40 to 3,200 degrees F. The thermometers are available with rigid, remote or All-Angle probes. **800/421-2853; www.palmerwahl.com. tpo**

people/awards

The Florida Department of Environmental Protection honored **Bonita Springs Utilities** with the 2012 Plant Operations Excellence Award for the East Water Reclamation Facility.

Rich Hunt, a maintenance reliability manager and field operations and maintenance specialist for Woodard & Curran, won the Operator Safety Award from the New England Water Environment Association (NEWEA).

The **Lee (Mass.) Wastewater Treatment Plant** received a 2012 Regional Wastewater Treatment Plant Excellence Award from the U.S. EPA.

Peter Laramie, chief operator of the Fair Haven (Va.) Wastewater Treatment Plant, received a 2012 Regional Wastewater Treatment Plant Operator Excellence Award from the U.S. EPA.

Charles Tyler, project/program manager of the Massachusetts Water Resources Authority's Deer Island Wastewater Treatment Plant (Boston area) received a 2012 Regional Wastewater Treatment Plant Operator Excellence Award from the U.S. EPA.

The **Wixom Wastewater Treatment Facility** received the Michigan Voluntary Protection Program Star Award from the Michigan OSHA.

Pasteurization Technology Group received the 2012 Katerva Materials and Resources Award for a wastewater disinfection technology that generates renewable energy.

The **Wausau (Wis.) Wastewater Treatment Plant** and **Becher-Hoppe** won the State Finalist Engineering Excellence Award from the American Council of Engineering Companies consin for installing microturbines to generate power from biogas.

TPO welcomes your contribution to this listing. To recognize members of your team, please send notices of new hires, promotions, service milestones, certifications or achievements to editor@tpomag.com.

education

California

The California Water Environment Association has a Collection System Benchmarking Workshop on Aug. 21 (location TBD). Visit www.cwea.org.

Georgia

The Georgia Association of Water Professionals is offering a Pipeline Collection Workshop on June 27 in Albany. Visit www.gawponline.org.

Illinois

The Central States Water Environment Association-Illinois Section is offering a Collection System Seminar on June 27 in Aurora. Visit www.cswea.org.

The Illinois Water Environment Association is offering a Nutrient Removal and Recovery Workshop on Sept. 13 in Sandwich. Visit www.iweasite.org.

Kansas

The Kansas Water Environment Association is offering the following courses:

- June 5 – Natural Systems for Wastewater Treatment, Dodge City
- June 7 – An Examination of Your Ethics, Dodge City
- June 11 – An Examination of Your Safety, Dodge City
- June 19 – Small Wastewater Systems, Dodge City
- June 27 – Special Topics-Corrosion, Dodge City
- July 2 – Wastewater Reclamation and Reuse, Dodge City
- July 16 – Intro to Water and Wastewater Conveyance, Dodge City
- July 30 – Wastewater Stabilization Lagoons, Dodge City

Visit www.kwea.net.

New York

The New York Water Environment Association has a Pump Stations and Pump Hydraulics Seminar on Aug. 21 in Rochester. Visit www.nywea.org.

Ohio

The Ohio Water Environment Association has an Operations/Laboratory Analysts Workshop Sept. 25-26 in Grove City. Visit www.ohiowea.org.

Wisconsin

The Central States Water Environment Association-Wisconsin is offering these courses:

- June 6 – Classic Collection Systems, Watertown
- July 25 – Collection Systems, Marshfield

Visit www.cswea.org/Wisconsin.

The University of Wisconsin Department of Engineering-Professional Development has a Wastewater Treatment Processes and Technologies course Sept. 24-26 in Madison. Visit <http://epdweb.engr.wisc.edu>. **tpo**

TPO invites your national, state, or local association to post notices and news items in the Worth Noting column. Send contributions to editor@tpomag.com.



UPCOMING TRAINING & EVENTS

NAWT

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Inspector Training and Certification:

Early June 2013 - Escanaba, MI
Check the website for more details!

August 29-30, 2013 - Casa Grande, Arizona
Univ. Of AZ, Contact: Janine Lane at (928) 782-5882 or janinel@calcs.arizona.edu

November 14-15, 2013 - Lakewood, CO
Colorado Professionals in Onsite Wastewater
Kate Carney at (720) 626-8989 or cpow@cpow.net

November 15, 2013 - Arlington, TX
RETS - Real Estate Training Systems
Contact: RETS at 817-861-9998 or rets@rets-llc.com

Operation and Maintenance Training Certification:

October 2-3, 2013 - Napa, CA
COWA - Evelyn Rosefield at (530) 513-6658 or evelyn@cowa.org

December 4-5, 2013 - Napa, CA
COWA & NAWT - Evelyn Rosefield at (530) 513-6658 or evelyn@cowa.org

Installer Workshops:

October 3-4, 2013 - Lakewood, CO
Colorado Professionals in Onsite Wastewater
Kate Carney at (720) 626-8989 or cpow@cpow.net

Other CEU's for Recertification:

October 17, 2013 - Sonora, CA
COWA System Controls, Evelyn Rosefield at (530) 513-6658 or evelyn@cowa.org

-- Watch the NAWT website and industry publications for updates --

For more information call:
800-236-6298

WWW.NAWT.ORG

CALENDAR OF EVENTS

June 3-5

New York Water Environment Association Spring Technical Conference and Exhibition, Sheraton Syracuse University Hotel & Conference Center. Visit www.nywea.org.

June 9-12

Water Environment Federation/California Water Environment Association Collection Systems 2013: Gold Nuggets of Knowledge, Sacramento Calif. Convention Center. Visit www.wef.org.

June 11-14

Mississippi Water Environment Association Annual Meeting and Technical Conference, Whispering Woods Hotel and Conference Center, Olive Branch. Visit www.mswea.org.

June 12

American Public Works Association-Washington State Chapter Northwest Fog Forum, Greater Tacoma Convention and Trade Center. Visit www.apwa-wa.org/chapter.

June 18-20

Ohio Water Environment Association Annual Conference, Great Wolf Conference Center, Mason. Visit www.ohiowea.org.

June 23-26

Michigan Water Environment Association Annual Conference, Boyne Mountain Resort, Boyne Falls. Visit www.mi-wea.org.

July 14-17

Georgia Association of Water Professionals Annual Conference and Expo, Savannah International Trade and Convention Center. Visit www.gawp.org.

July 30-Aug. 2

Kansas Water Environment Association Annual Water and Wastewater School, Lawrence. Visit www.kwea.net.

Aug. 6-8

2013 International Society of Automation Water/Wastewater and Automatic Controls Symposium, Crowne Plaza Orlando-Universal Hotel, Orlando, Fla. Visit www.wef.org.

Sept. 29-Oct. 1

Atlantic Canada Water & Wastewater Association Annual Conference, Crown Plaza, Fredericton Convention Center, Fredericton, New Brunswick. Visit www.acwwa.ca.

See Both Sides

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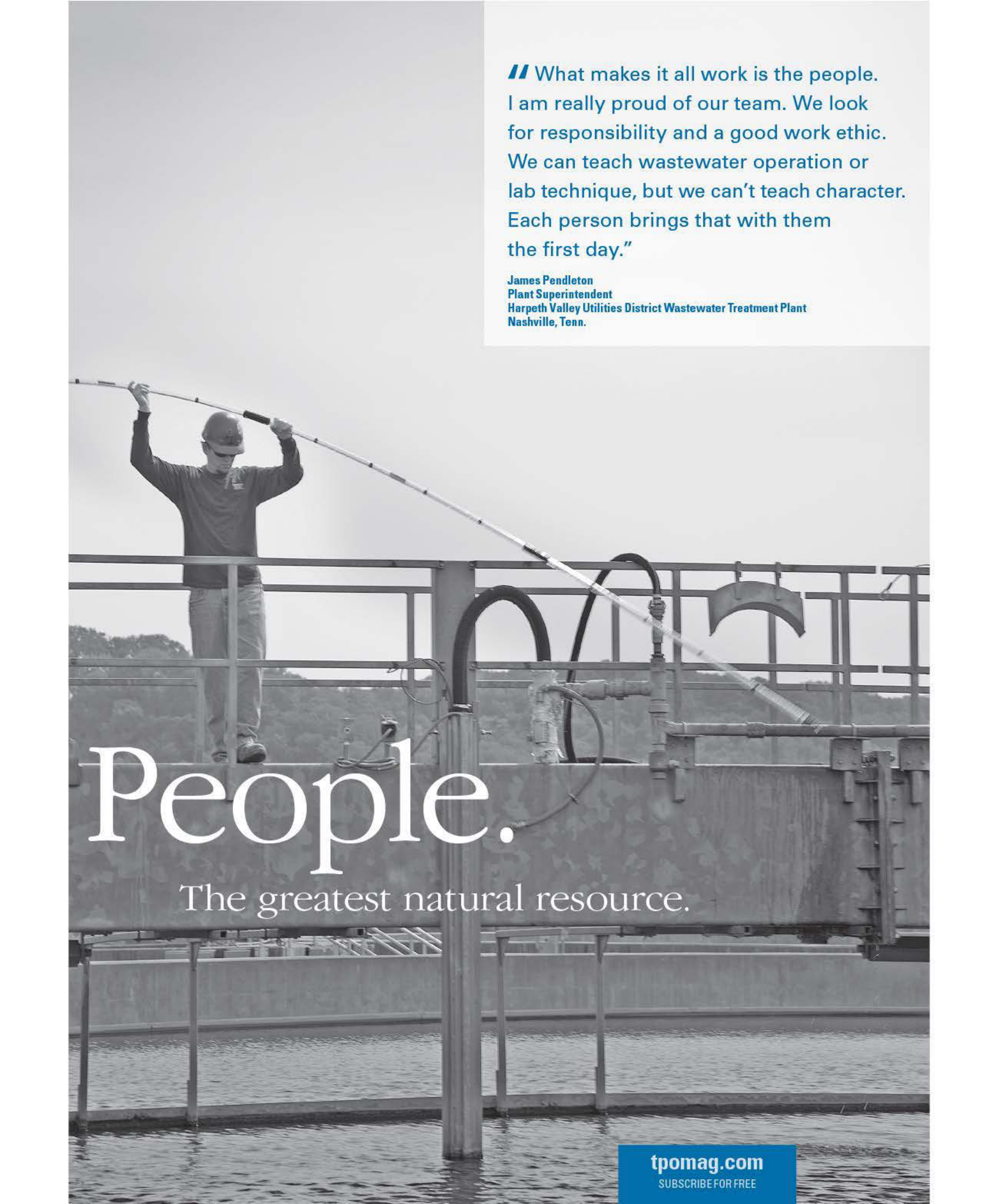
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James Pendleton
Plant Superintendent
Harpeth Valley Utilities District Wastewater Treatment Plant
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At the City of Justin's Wastewater Treatment Facility, Superintendent Carl Naumann is helping his team by sharing his immense knowledge of the treatment process. "I've never been one to say, 'If it's not broke, don't fix it.' By making small adjustments throughout the plant, you'll understand the effects, and know how to fix things in the future," he shared.

Carl's dedication to helping his up-and-coming operators hone their craft is invaluable to the City of Justin. "It starts with understanding, and then really getting into it. I'm always asking the guys to name different process levels from around the plant. When they know the answers off the tops of their heads, I say, 'Bingo! You just learned how to be an operator.'"

Another way Carl is helping to improve the plant is by performing select laboratory testing in house. "When I came here [to Justin], we were outsourcing our TSS (total suspended solids) testing, something I knew we could be doing ourselves. When I priced out the ovens, paper and analytical balance from you guys [USABlueBook], it was a no brainer. Once we brought everything in-house, my TSS testing costs were reduced by \$11,000 annually, and it was all thanks to USABlueBook!"

"My TSS testing costs were reduced by \$11,000 annually, and it was all thanks to USABlueBook!"

USABlueBook is proud to assist Carl and his team with everything they need for their plant. As he put it best, "It's always an adventure, and there's always something. It's nice to know I can just grab my USABlueBook."

Carl Naumann
W&WW Superintendent
City of Justin WWTP
Justin, TX



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Big Blue Bio-Block	30-lb Block	49831	399.95

See pages 202-203 in USABlueBook Catalog 124 for more information.



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