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DECEMBER 2012

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on the cover

By 2020, the East Bay Municipal Utility District wastewater treatment plant could be selling twice as much electricity as it uses. It already sells excess power. Power plant supervisor Dave Allen is shown with one of four diesel engines in the main facility. High-efficiency turbine generators burning biogas produce the plant's energy. (Photography by Keith Dixon)

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Driving Home a Simple Point

THERE'S A ROLE FOR EDUCATION IN HELPING CLEAN-WATER AGENCIES DEAL WITH PROBLEMS CAUSED BY THE PROLIFERATION OF WIPE PRODUCTS

By Ted J. Rulseh, Editor

This month's "In My Words" feature describes the excellent work the Maine Water-Water Control Association is doing to help deal with the problems caused by wipe products that get flushed down toilets into the sewers and to treatment plants.

It's a great example of a group taking serious action instead of just complaining — and it's a highly ambitious effort that includes working with the state legislature and with a global association representing the very large and growing nonwoven products industry.

Their work should inspire others in the profession. The outcome is still very much in question, and the results may take a long time to show up, but this is the kind of effort that could lead to a lasting solution to what has become a serious problem. It's well worth reading about this group's endeavors.

THE ROLE OF EDUCATION

My only quibble with the approach is that it seems to downplay the potential benefits of customer education. It's clear that education is not the whole solution, because the necessary messages will never reach everyone, and some people won't change their ways no matter how often they are shown the benefits of doing so — if they're in the habit of flushing wipes, they will keep flushing.

It's also true that in the ideal world, more wipes should be truly flushable (disintegrating in water like toilet paper) and consumers should be able to trust a "flushable" label on container.

But this is a case where the educator has some clear advantages. First, the message that needs delivering is exceedingly simple and clear. Second, the message sender has a bully pulpit and easy access to the recipients. Third, the message reaches well beyond the issue of wipes to include any item that when flushed causes harm.

And that message is: "Flush nothing except toilet paper."

RISKING CONFUSION

Now, an argument can be made that consumers who get that message will become confused when they encounter a

package of wipes labeled "flushable." I would respond that people are likely to trust their local water and wastewater utility more so than the maker of a paper product.

Besides, "no flush" is a whole lot less confusing than "no flush except when a container is labeled 'flushable' and you can verify through research that the product in question is in fact made to internationally recognized flushability standards."

Furthermore, an extremely simple, unambiguous message is easy to communicate and to repeat until it sinks in. How about printing it on every water and sewer bill? Not on bill inserts, which arguably no one reads (I don't believe I have ever read one), but right there under "Amount Due"?

How about putting it front and center on the website home page one click away from a clear explanation of why? How about printing up suitable-for-framing index-card-size

"No flush" is a whole lot less confusing than "no flush except when a container is labeled 'flushable' and you can verify through research that the product in question is in fact made to internationally recognized flushability standards."

signs that say "SOS (Save Our Sewers): Flush nothing except toilet tissue" for people to hang over their paper holders?

Suppose local radio stations could run occasional public service announcements with the "no flush" message. How about making sure every treatment plant tour includes the bar screens and a lesson on how flushing the wrong items causes waste material to accumulate there, costing money for handling and disposal and helping to drive up rates? All these actions, and others like them, are simple, low-cost and potentially effective.

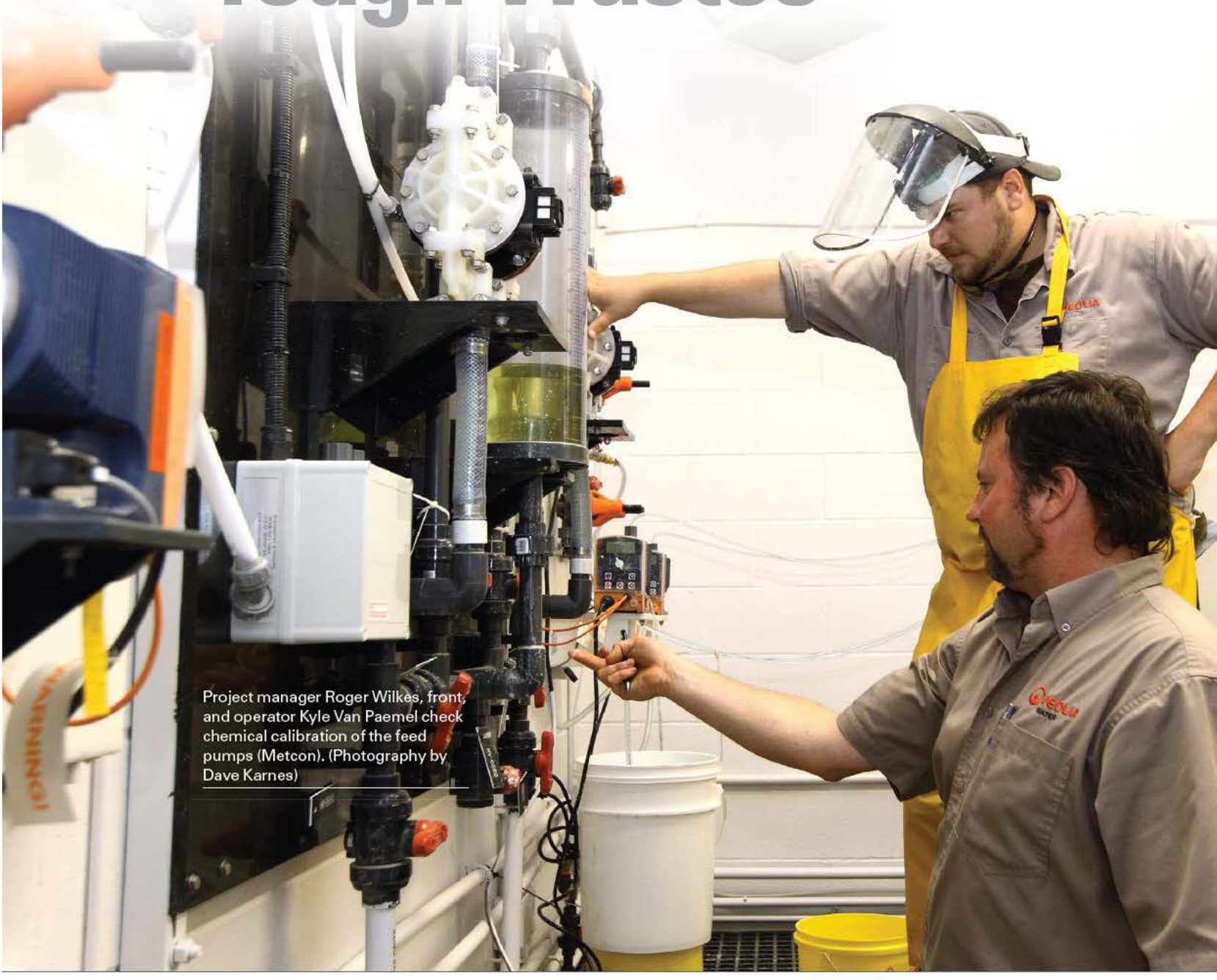
IMPACT TODAY

As noted, education won't get the whole job done. The ideal combination includes well-informed customers and products designed to do no harm. The second half of that bargain could be years away. Education can have a meaningful impact — and in very short order. Why not give it a legitimate shot? tpo

A NEW MBR PLANT IN PORT ROWAN SUCCESSFULLY HANDLES A HIGH-STRENGTH MIXTURE OF REGULAR INFLUENT, SEPTAGE, PORTABLE TOILET WASTE AND LANDFILL LEACHATE

Tackling Tough Wastes

By Jim Force



Project manager Roger Wilkes, front, and operator Kyle Van Paemel check chemical calibration of the feed pumps (Metcon). (Photography by Dave Karnes)

TALK ABOUT A TOUGH ASSIGNMENT. IN PORT ROWAN, Ontario, a greenfield treatment plant equipped with the latest technology takes on high-strength wastewater loaded with septage, hauled wastes and landfill leachate and discharges to an environmentally sensitive waterway.

But the Port Rowan Wastewater Treatment Facility is cutting it, according to Bob Fields, manager of the Environmental Services Division for Norfolk County and a licensed water and wastewater operator. "We're starting to meet our limits," he says. "We've been adjusting the blending of the wastes, trying to find the sweet spot. We've had a bit of an issue with phosphorus and other constituents from our hauled wastes, but we're getting that under control."

Port Rowan, a small community on the north shore of Lake Erie, thrives on tourism and fishing. For years, the community was served by a small facultative lagoon system that was under capacity and struggled to meet its permit levels.

With the internationally designated Long Point Biosphere just downstream of the plant's discharge point, environmentalists and government regulators brought pressure on the county to install more effective technology for the Port Rowan facility. Or, as project manager David Evans of the firm R.V. Anderson said in a news report about the official opening of the plant, "It became pretty obvious with the sensitivity of the area that we were going to have to do the best technology application."

The aeration process at the Port Rowan plant has to handle tough wastes like septage and landfill leachate.

The technology includes SCADA-driven blending of the various waste streams, preliminary and primary treatment, and a membrane bioreactor (MBR) system.

MIXED WASTEWATER

Raw sewage from the community of Port Rowan passes through a pump station equipped with flow equalization and then into the preliminary treatment area, where it is screened in two mechanically cleaned Mahr bar screens (Headworks).

Hauled waste from portable toilets, septic tanks and holding tanks comes in through a dual receiving station in the headworks building — it can handle more than one truck at a time if necessary. This wastewater passes through a 6 mm coarse screen (also Headworks). Leachate from the area landfill, free of rags, flows directly into the wet well, which contains three chambers, one for each waste stream.

The blend of these wastes is a key to successful treatment. "We're tweaking the blend all the time, basically using a trial-and-error method," Fields says. "Depending on the quality of the raw sewage, we can add more or less leachate."

The design capacity of the hauled waste pumps is 20 percent of the raw sewage flow; the leachate pump capacity is 10 percent of the raw sewage flow. The blend is monitored and controlled by the plant's SCADA system (Hollen Controls).

In the headworks building, a cyclone-type grit remover (ENV Treatment Systems) takes out sand and debris and pumps it to a classifier.

profile Port Rowan (Ontario) Wastewater Treatment Facility

BUILT:	2012
POPULATION SERVED:	2,200
FLOWS:	0.3 mgd design, 0.15 mgd average
TREATMENT LEVEL:	Tertiary (Level 4 in Canada)
TREATMENT PROCESS:	Membrane bioreactor
RECEIVING STREAM:	Dedrick Creek to Lake Erie
BIOSOLIDS:	Aerobic digestion, land application
STAFF:	One full-time operator
WEBSITE:	www.norfolkcounty.ca
GPS COORDINATES:	Latitude: 42°37'19.24" N; Longitude: 80°27'46.88" W

The Port Rowan plant team includes, from left, operator Kyle Van Paemel, Environmental Services Division manager Bob Fields, and project manager Roger Wilkes.

Port Rowan Wastewater Treatment Facility
PERMIT AND PERFORMANCE

	DESIGN	INFLUENT	EFFLUENT	PERMIT
CBOD	150 mg/L	110-250 mg/L	2.5 mg/L	5.0 mg/L
TSS	200 mg/L	120-400 mg/L	1.0 mg/L	2.0 mg/L
Phosphorus	5 mg/L	2.5-8.7 mg/L	0.06 mg/L	0.12 mg/L
Total ammonia	N/A	16-74 mg/L	2 mg/L (freezing weather) 4 mg/L (freezing weather)	1 mg/L (warm weather) 2 mg/L (warm weather)
pH	N/A	6.8-7.5	7.5-8.5	7.0-8.5

The effluent moves on to a pair of rectangular primary clarifiers. After settling, it passes through a 1 mm fine-mesh filter before the biological tank in the MBR system, or can be diverted back to the 580,000-gallon equalization tank next to the facility. "The equalization reservoir gives us a cushion against high flows or mechanical breakdowns," Fields says.

FOULING PREVENTION

The fine screen protects against fouling in the membrane portion of the Zenon MBR (GE Water & Process Technologies). The MBR includes a biological treatment tank containing two parallel anoxic/oxic trains.

The anoxic zone is a "swing zone" that can function in the oxic mode during peak load conditions. The oxic (or aerobic) zone contains fine-bubble membrane diffusers (SSI Aeration Systems). Positive-displacement blowers are from Aerzen Canada, and Flygt (Xylem) provided the submersible pumps and mixers.

Two separate membrane trains are available, each with two ZW 500d cassettes, for a total of four cassettes. Each cassette contains 38 hollow-fiber membrane modules. Normally, the primary effluent is split into the two trains and enters the anoxic tank, then flows under a baffle to the oxic zone. In low-flow conditions, only one train is in operation.

Membrane maintenance includes chemical cleaning with sodium hypochlorite and recovery cleaning with citric acid. Syntec Process Equipment supplied the process valves. The mixed liquor from the aeration tanks then overflows into the MBR tanks, and the sludge from MBR system is recirculated to the anoxic tanks. The excess sludge is wasted and co-settled with primary sludge before final treatment.

HANDLING SOLIDS

The treated wastewater can be disinfected with chlorine and dechlorinated, but since startup in the spring of 2012, the coliform count has been so low that this step hasn't been activated. The staff can also add alum for phosphorus removal and sodium hydroxide for pH adjustment through multipoint injection systems. Metcon Sales and Engineering supplied the chemical metering pumps.

"We've been adjusting the blending of the wastes, trying to find the sweet spot. We've had a bit of an issue with phosphorus and other constituents from our hauled wastes, but we're getting that under control."

BOB FIELDS

A single-stage aerobic digester processes the primary and waste activated sludge solids, and pumps (Weir Minerals) deliver the treated material to an on-site biosolids storage tank. Sludge and scum collectors are from C & M Environmental Technologies.

The facility has about 160,000 gallons of storage capacity, good for about a year. Norfolk County uses a third-party contractor to deliver the biosolids to area farms. "Liquid application is typically the preference of the large agricultural community up here," says Fields. "The nutrients like nitrogen and phosphorus are in demand from ginseng farms in the area once the crop has been harvested."

The plant has an odor-control system. Operating at negative pressure, two wood chip biofilter units pull gases from the headworks and digestion areas and strip off odor-generating compounds. These areas are covered to prevent odorous releases. The plant operates with one full-time operator on site, with backup available if necessary. Veolia Water North America has the operational contract for the county.

ADAPTING TO CHANGE

Moving from a lagoon to an MBR is quite a jump, and Fields credits membrane manufacturer GE with helping the county get familiar with the technology. "They were an integral part of the whole process," says Fields. "We selected our membrane vendor before the actual design of the plant. We were able to use their engineers and designers to help. They played a major role and continue to be a great resource for us."

The countywide SCADA master plan also helped. The plant SCADA system is based on the master plan and ensures that data-handling conflicts are avoided. "We developed our own standards, and it's paying off," Fields says.

Still, the facility represents a large investment for this small community. The project cost about $11 million (Canadian), of which $3.9 million came from the federal government. "It's fairly expensive to operate," Fields says. "Our energy costs are high, but then we're treating a high-strength waste."

The economic and environmental impacts of the plant make it worthwhile. The grand opening was attended by more than 100 officials and fea-

Project manager Roger Wilkes takes daily readings on the motor control center (Allen-Bradley/Rockwell Automation).

Operator Kyle Van Paemel in the laboratory (digital scale from Ohaus).

Port Rowan Wastewater Treatment Facility Influent Characteristics

	Average daily flow	BOD	TSS (mg/L)	TKN (mg/L)	P (mg/L)
Raw sewage	260,000 gallons	150 mg/L	200 mg/L	34 mg/L	5 mg/L
Holding tank waste/septage	26,000 gallons	650 mg/L	1,320 mg/L	175 mg/L	30 mg/L
Septage	(included above)	2,330 mg/L	10,400 mg/L	450 mg/L	143 mg/L
Leachate	13,000 gallons	195 mg/L	68 mg/L	256 mg/L	2 mg/L

The aerobic digester at the northwest side of the administration building is fitted with an odor-control system.

tured poster boards by all vendors. Norfolk County councilors Betty Chanyi and Don Edwards — representing Federal Member of Parliament Diane Finley — stressed the economic benefits. Chanyi noted, "the plant provides an opportunity for residential and business expansion." Edwards called the facility another successful step toward economic recovery.

"We received a lot of scrutiny when it came to the environmental assessment for the facility. It's a very sensitive receiving stream, experiencing low seasonal flows."

BOB FIELDS

HELP FOR THE ENVIRONMENT

The local environment may be an even bigger beneficiary. The plant discharges to Dedrick Creek, which flows into Lake Erie just a few miles upstream of Long Point, a 20-mile sand spit that juts into the lake and features one of Canada's most fragile ecosystems. In 1986, the United Nations Education, Scientific and Cultural Organization (UNESCO) recognized the

RESTORING A WETLAND

While the old facultative lagoons at Port Rowan have been replaced and no longer treat wastewater, they will still serve a purpose in the community's long-range plans. The lagoons will be reshaped into a wetland with new vegetation and walking trails, and the community hopes it will attract visitors. The total restoration area is about 75 acres.

Bob Fields, manager of the Environmental Services Division for Norfolk County, calls it an exciting development with practical applications. "We involved the local drainage commission in the design," he says. "It will have offline and online ponds and actually be part of our drainage system."

In addition, various groups and people are involved in the wetland development. "We're working with an extensive team on the steering committee," Fields says. "We've developed a concept plan that includes tall grasses, the ponds and shrubbery." The group includes the Ontario Ministry of Natural Resources, Bird Studies Canada, Long Point Waterfowl, Long Point Region Conservation Authority, Spriet Associates engineering and architectural firm, Long Point Biosphere, Norfolk County Alternative Land Use Services Program, Nature Conservancy Canada, and the Norfolk Land Stewardship Council.

"We are probably a year or two from completion," Fields says. "We are working through some issues with our various regulatory authorities with regard to removal or reuse of the existing biosolids in the old lagoons. We would like to be able to keep them on site to augment some of the clay berms that we will be reshaping." Birds have been studied in this area for over 40 years. "Now," Fields says, "instead of losing this site, observers will be able to continue on with their research."

area as a prime example of a Great Lakes coastal ecosystem and designated it as a biosphere, only the third such area in Canada.

The land is a unique blend of habitats — beaches, dunes, meadows, woodlands, marshes, ponds and streams — and is a world-renowned refuge and stopover for migrating birds in the fall and spring. "We received a lot of scrutiny when it came to the environmental assessment for the facility," says Fields. "It's a very sensitive receiving stream, experiencing low seasonal flows. Birders, environmentalists and others were behind the move to upgrade this facility."

Fields says the goal was to build a facility that could meet very stringent criteria. Although the plant has been operating for less than a year, the performance data makes it obvious that Port Rowan is meeting the challenge. **tpo**

"We selected our membrane vendor before the actual design of the plant. We were able to use their engineers and designers to help. They played a major role and continue to be a great resource for us."

BOB FIELDS

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Wastewater operator Bobby Tucker measures a clarifier sludge blanket at the Gallatin Wastewater Treatment Facility. (Photography by Rachel Paul)

Savings in the Mix

THE GALLATIN TREATMENT PLANT TURNS TO LIME STABILIZATION TO CUT BIOSOLIDS COSTS SIGNIFICANTLY AND DELIVER A BENEFICIAL PRODUCT TO LOCAL FARMERS

By Ted J. Rulseh

THE GALLATIN (TENN.) WASTEWATER TREATMENT Facility used to pay farmers 2.5 cents per gallon — up to $25,000 per month — to land-apply liquid Class B biosolids. Today, the plant produces a lime-stabilized Class A biosolids product that farmers can take away at no charge — and in the future may purchase by the ton.

It's all the result of a major upgrade that doubled the plant's design capacity to 12 mgd and added a lime stabilization building. Although the biosolids facility went online only last February, the product is already gaining favor with farmers and with local residents who use it on their gardens and lawns.

"Because we're just getting started, right now about 75 percent of our biosolids is going to landfill," says Brandon Traughber, chief wastewater plant operator. "We're just waiting for farmers to say, 'Hey, why go 40 or 50 miles down the road to buy lime to raise my soil pH when I can go to the treatment plant and get a product that does the same thing — and has nutrient value, too?'

"The mayor [Jo Ann Graves] has said we're going to give it away for the first year just to see what the demand will be. If the farmers really want it once they start using it, then we may be able to generate a little revenue. If we can charge, say, $10 per ton, then we can almost recover the cost for the lime kiln dust we have to buy."

BUILT FOR THE FUTURE

Gallatin, county seat of Summer County, is home to about 30,000. The flow to the treatment plant is about 90 percent residential. Inflow and infiltration cause flow spikes in the winter months; the city is investing about $1 million a year in I&I control.

The original plant was built in 1970 and received a major upgrade in 1983. The new facility was built on the same site. "We were right at the old plant's capacity," says Traughber. "It was rated at 5.5 mgd, and our average flows were right around 5.5 to 6 mgd. We had to build for growth in the city."

The old plant had square-tank aeration basins with surface aerators. The new one, online since January 2011, has an oxidation ditch (WesTech) with anoxic and aerated zones. "We're on a big enough receiving stream [the Cumberland River] so that we don't have an ammonia limit yet, but the state and EPA require us to monitor for it on a quarterly basis. So, anticipating that we'll probably have an ammonia limit in the future, we decided to put a system in place to allow for ammonia removal."

profile Gallatin (Tenn.) Wastewater Treatment Facility

POPULATION SERVED:	30,000
PLANT FLOWS:	12 mgd design, 6 mgd average
PLANT PROCESS:	Activated sludge/oxidation ditch
BIOSOLIDS PROCESS:	Aerobic digestion, centrifuge dewatering
BIOSOLIDS USE:	Lime stabilization (landfill as a backup)
BIOSOLIDS VOLUME:	770 dry tons per year
WEBSITE:	www.gallatinpublicutilities.com
GPS COORDINATES:	Latitude: 36°20′05.45″ N; Longitude: 86°27′49.54″ W

The Gallatin team includes, from left, chief wastewater plant operator Brandon Traughber, wastewater attendants Leslie Gammons and Terry Fultz, wastewater operator I Wayne Thompson, and wastewater operator II Bobby Tucker. Not shown: wastewater assistant Kevin Byrd and wastewater operator II Gary Henson.

"A load of centrifuged cake that goes to landfill costs us about $900. If we take that same amount, add about $400 of lime kiln dust and treat it down to Class A, we can save about $500."

BRANDON TRAUGHBER

Traughber's fully cross-trained operations team includes Bobby Tucker and Gary Henson, wastewater operator II; Wayne Thompson, wastewater operator I; Leslie Gammons, Matt Wilson and Terry Fultz, wastewater attendants; and Kevin Byrd, wastewater assistant.

DIGESTERS IN SERIES

On the solids side, the Gallatin team made the move to Class A largely to get beyond the site monitoring requirements associated with Class B material. Some 85,000 gallons per day of activated sludge is wasted from the oxidation ditch at 0.5 to 0.75 percent solids.

The plant has six digesters with a combined 3-million-gallon capacity. Numbers 1, 2 and 3 are kept empty and held in reserve for emergencies. Waste activated sludge goes straight to the Number 4 digester, aerated continuously during a five-day detention time. It then gravity feeds into the Number 5 digester for daily aeration (about 12 hours), followed by settling and decanting.

Thickened material (1.5 to 1.75 percent solids) is then pumped to the Number 6 digester, which essentially serves as a holding tank. Digested solids first pass through an inline Muffin Monster grinder (JWC Environmental) and then to a polymer injection system (Fluid Dynamics). The material is then fed to one of three centrifuges (Andritz Separation), each with 220 gpm capacity, that dewater it to 23 to 24 percent solids.

The resulting cake can be emptied into trailers and sent to landfill or fed into the lime stabilization process, supplied by Alka-Tech.

MAKING PRODUCT

"Material comes out of the centrifuge discharges into an auger that sends it over to the lime stabilization building," says Traughber. "It fills a hopper there, and once the hopper gets to a certain level, the system kicks into automatic. It augers biosolids out of the bin and sends it to a mixer that adds lime kiln dust.

"The mixing process is automated — we can adjust the mix by way of the SCADA system (M/R Systems). Currently, the auger pulls out about 600 pounds per minute, to which we add 200 pounds of lime kiln dust. We run the process about six to eight hours a day, generating about 30 tons of material."

The mixture is transferred to four bunkers inside a sheet metal building.

(continued)

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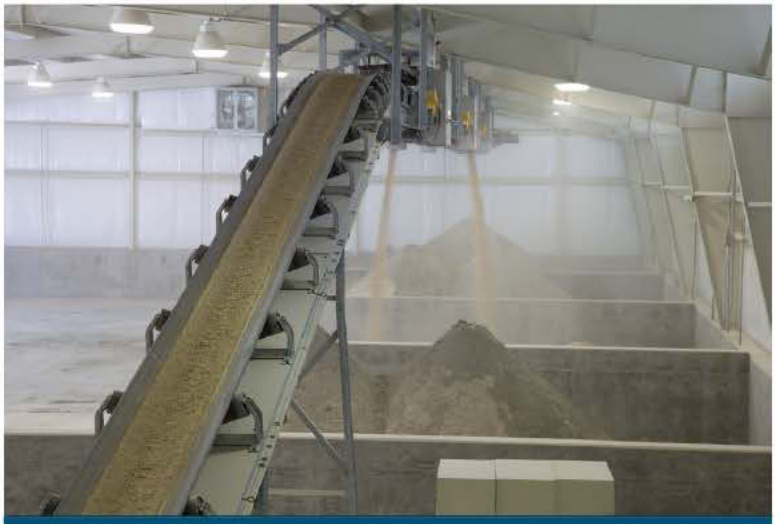
Centrifuged biosolids cake mixes with lime, then travels up a conveyor belt that delivers it to the bunkers. The lime stabilization process is supplied by Alka-Tech.



IMPURE IS BETTER

The Gallatin lime stabilization process uses lime kiln dust instead of quick lime, even though that product is slightly more expensive, at about $57 per ton.

"The kiln dust is about 45 percent active lime," says Brandon Traughber, chief plant operator. "If you use straight lime, you have to use more of it. That's because the federal 503 regulations require you to bulk up the material to over 50 percent solids.

"If you use straight lime, you have to add a lot just to bulk it up. The kiln dust contains about 55 percent inactive ingredients that help bulk up the mixture, yet it still contains enough lime to sustain the exothermic reaction."

The Gallatin plant stores up to 300 tons of lime kiln dust on site in two silos about 52 feet tall and 12 feet in diameter.

"The mayor has said we're going to give it away for the first year just to see what the demand will be. If the farmers really want it once they start using it, then we may be able to generate a little revenue."

BRANDON TRAUGHBER

There it stands for 72 hours at a pH above 12 to comply with federal standards for Class A material. "We have to make sure the temperature stays above 52 degrees C (126 degrees F) for at least 12 hours," Traughber says.

"We have a temperature probe in each bunker. We put that probe into the pile, and with the SCADA computer we trend that temperature over a 72-hour period. I wanted those temperature probes so that if the state ever had any question about whether we sustained the necessary temperature, we'd be able to pull up the chart and say, 'OK, what date do you want?' " Proper pH is verified by laboratory testing.

QUALITY MATERIAL

Heat from the exothermic reaction with the lime drives off substantial moisture, so that the final product contains about 65 percent solids and has the consistency of cornmeal or flour. A small Kubota tractor with a chain-and-flight conveyor is used to load customers' incoming trucks or trailers with material for transport.

The Gallatin plant uses drum screens manufactured by Parkson Corp.

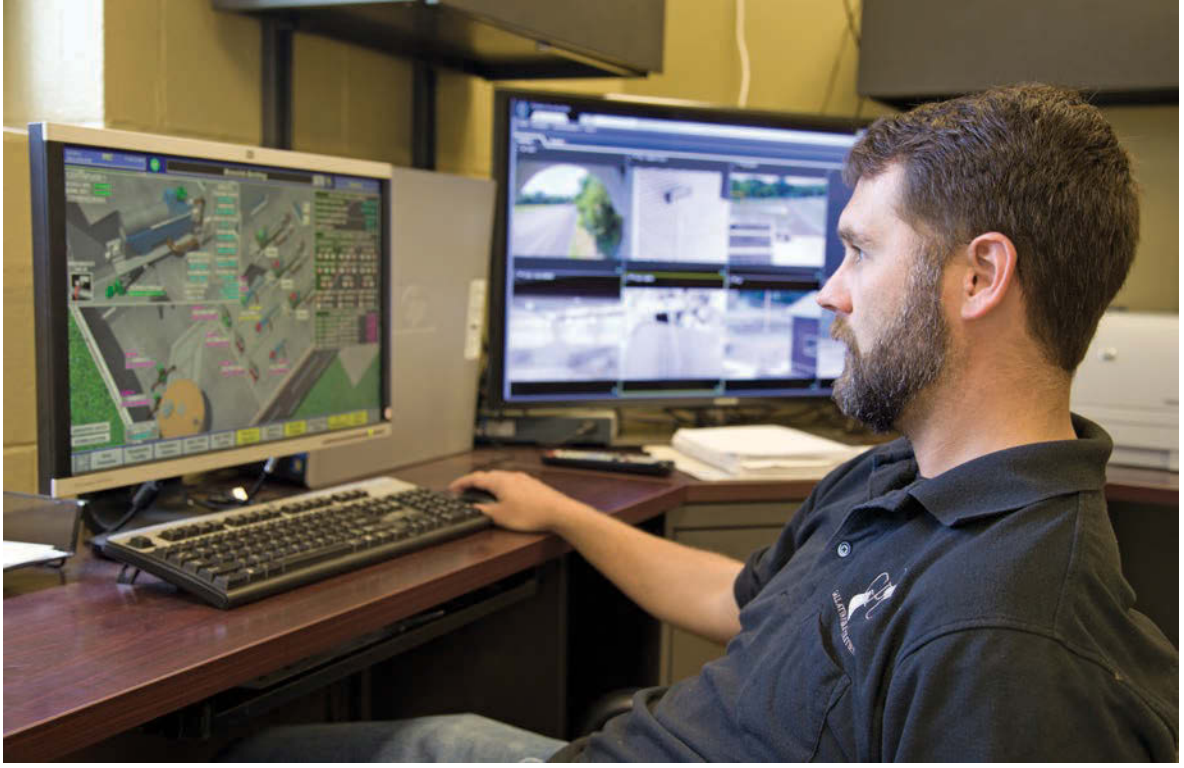
Wastewater operator Wayne Thompson checks samples for *E. coli* testing in the room that houses the plant's UV disinfection system (WEDECO – a xylem brand).

It's easy to see why the Gallatin team prefers to maximize lime stabilization in the future. "A load of centrifuged cake that goes to landfill costs us about $900," says Traughber. "If we take that same amount, add about $400 of lime kiln dust and treat it down to Class A, we can save about $500. If we run the process four days a week, we can save $2,000. If we do that over the course of a year, we're saving some real money."

"We'd like to get to 100 percent lime-stabilized biosolids and do away with landfilling — it costs us more, and it doesn't benefit anybody. If we lime stabilize, we save money, and local farmers get the benefit."

And the benefits are substantial for the area's high-clay, low-alkalinity soils. "In this part of the country, everybody has to lime their fields," says Traughber. "They're having to pay $10 to $15 a ton for lime."

Customers now, besides homeowners taking small amounts, are mainly fescue farmers who can apply material between cuttings of hay. Farmers have taken as much as 40 to 45 tons at a time. The material contains on average about 1.0 percent nitrogen and 0.5 percent potassium.



Chief wastewater plant operator Brandon Traughber checks plant operations on the SCADA system from a central office.

GETTING THE WORD OUT

So far, Gallatin has relied mainly on word-of-mouth marketing, although Gallatin Utilities included a letter about the material in residents' water bills and information is available on the city website.

"We've also have talked with the county agriculture extension office, the local Natural Resources Conservation Service, and the University of Tennessee Extension office," says Traughber. The idea is that advisors in those offices will let farmers know about the products as an alternative to commercial lime.

"It just takes time," he says. "At the time we started making the product, a lot of farmers had just finished liming their fields before they started their spring crops. We just barely missed that window.

"Give us a year to get the word out. I'm hoping that by this time next year, once farmers start talking among themselves, we'll see plenty of demand. A lot of farmers are saying that in fall when the crops come off, that's when they're going to start using it." tpo

> "It just takes time. At the time we started making the product, a lot of farmers had just finished liming their fields before they started their spring crops. We just barely missed that window."
>
> **BRANDON TRAUGHBER**

more info:

Andritz Separation, Inc.
800/433-5161
www.andritz.com

Alka-Tech
800/247-2464
www.alka-tech.com

Fluid Dynamics Inc.
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www.dynablend.com

JWC Environmental
800/331-2277
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UPGRADE INNOVATION

The upgrade to the Gallatin Wastewater Treatment Facility had benefits beyond the new oxidation ditch secondary treatment system and the Class A biosolids process. It includes innovations that improve effluent quality, enhance staff efficiency, and conserve potable water. "We have four new secondary clarifiers, but we still keep the original clarifiers to use for tertiary clarification," says Brandon Traughber, chief plant operator. "It wasn't very expensive to rehab them. The effluent from the new secondary clarifiers actually feeds the old clarifiers. That way, if anything else can settle out, we get that opportunity."

"The old plant used chlorine disinfection, and we switched over to UV [WEDECO – a xylem brand]," he says. "We have four UV banks and run at about 25 percent of capacity. We rehabbed the old chlorine contact chamber and built a building on top of that for the UV system and our internal plant water system." That system provides 250,000 to 300,000 gpd of final effluent for purposes such as equipment washdown and office landscape irrigation.

"We add liquid bleach to the plant water to provide a little chlorine residual for personal protection," says Traughber. "When we first switched over from the old plant to the new, the man from the utility who reads our meter thought it was broken. They called me from the office and said, 'What's wrong with your water meter? You only used 300 gallons last month.' Our annual budget for water used to be $60,000 per year. This year it was $2,000."

A SCADA system (M/R Systems) was another major improvement: The plant is now fully automated. Magmeters (KROHNE) and ultrasonic sensors (Pulsar Process Measurement) monitor water levels and flows throughout the process. Various labor-intensive processes have been automated. For example, operators no longer have to activate pumps manually to pump out the scum pits. A sensor now monitors the level and turns the pumps on and off as needed.

Cleaning Up and Conserving

MACON WATER AUTHORITY'S PUBLIC OUTREACH EFFORTS ARE RECOGNIZED WITH MULTIPLE AWARDS FROM A GEORGIA ASSOCIATION

By Briana Jones

Taking home the prize for "Biggest Catch of the Day" would put a smile on any young fisherman's face. That's just one award bestowed at the Macon Water Authority's (MWA) annual Kids Fishing Derby.

The Derby and the Ocmulgee Alive! river cleanup, award-winning components of MWA's public outreach program, draw hundreds of visitors to the Macon area and generate awareness on the importance of water as a resource.

In 2011, the Derby earned the Georgia Association of Water Professionals' Best Innovative Initiative Award in Public Education, then the river cleanup won GAWP's Certificate of Distinguished Achievement. In the bargain, the MWA received the GAWP Gold Award for its wastewater collection system.

UNIQUE IDENTITY

The authority has put its best foot forward in educating the public on water quality. The Lower Poplar Street Water Reclamation Facility (12 mgd average) and the Rocky Creek Water Reclamation Facility (18.5 mgd) serve more than 45,000 customers in Macon and Bibb counties.

"MWA strives to make our customers aware of our environmental stewardship, and that they have a responsibility for that stewardship," says Mark Wyzalek, director of laboratory and environmental compliance for MWA.

Started about eight years ago, the Ocmulgee Alive! river cleanup is held with the statewide Rivers Alive campaign in October each year to commemorate the Clean Water Action month. Wyzalek worked with board members to bring the cleanup to fruition. "The Macon area needed a regular cleanup event," he says. "I saw the value in it for the authority and for the community."

"We have to educate people on certain contaminants that water and wastewater treatment plants cannot remove."

GARY McCOY

The local event has its own identity with the help of local sponsors like YKK USA (a manufacturer of zippers) and Graphic Packaging International. "We have really good partnerships with local companies that sponsor the event," says Wyzalek. "We have our own T-shirt every year, and the sponsors' donations help pay for those. Most other cleanups get the generic Rivers Alive shirt. We want to make people feel how unique it is to Macon as part of the community."

PHOTOS COURTESY OF MWA

L. David Martin Jr. was all smiles looking over the fish his family caught during the MWA Kids Fishing Derby.

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.

The river cleanup is open to all ages. Volunteers meet on a Saturday to clean up the river system that branches off of the Ocmulgee River. Wastewater discharge is only one form of point source pollution to the streams, explains Wyzalek. "Our goal is to help everyone become aware of water quality and what it means to the community," he says. "They can see firsthand the effects of nonpoint pollution, in this case, littering."

INNOVATIVE LEARNING

Community members can also take part in a fishing competition offered by MWA. Each year, the Georgia Department of Natural Resources sets aside three days in which people are allowed to fish without licenses. MWA selects one of those days for the Kids Fishing Derby. Kids ages 3 to 16 fish in Javors Lucas Lake, a 625-acre lake that supplies drinking water to Macon and Bibb counties. They compete to catch bass, bream and catfish.

"We host the tournament, but a local sporting goods store, Academy Sports & Outdoors, sponsors it," says Gary McCoy, MWA director of water. "We educate the public on the importance of water. The Department of Natural Resources is out there explaining fishing rules and regulations."

To get the word out about the event, the MWA public relations team sends out flyers to all local television and radio stations, churches and youth organizations. "We do all the advertising our-

selves," says McCoy. MWA volunteers include plant superintendents, board members, operators and even the executive director.

No kid goes home without a prize. All the money MWA raises goes directly back into the fishing tournament. With more than 80 sponsors, kids receive about $5,000 in prizes each year, ranging from MP3 players and Wii gaming devices to haircuts and McDonald's gift certificates.

CRITICAL EDUCATION

Operator Bobby Davis works at the Rocky Creek plant. As a volunteer at the derby, he helped prepare food and organize the kids. "I think the kids really enjoy the derby," says Davis. "The water authority really stocks those ponds to ensure the kids catch something. A lot of the kids have never been fishing before. I think the event will leave a good impression with them."

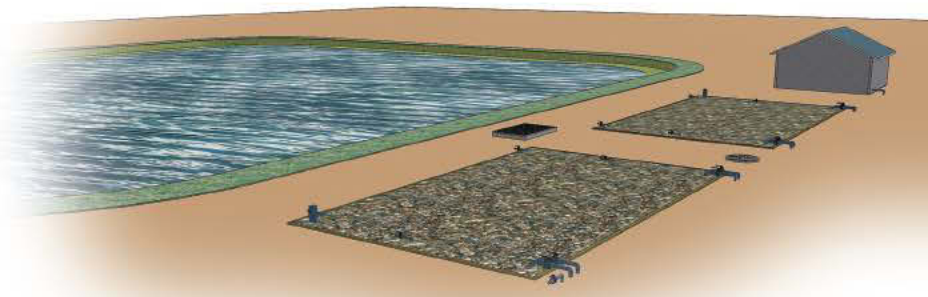
The fishing derby is meant to teach young people and adults about water. "We have to educate the public that water is our most precious resource," says McCoy. "Our water comes from the Ocmulgee River. What you put in that river, you're actually putting in your system. This is the same water, just recycled over and over again.

"We have to educate people on certain contaminants that water and wastewater treatment plants cannot remove." tpo

A group from YKK USA collects debris from the river during the 2011 cleanup event, Ocmulgee Alive!

Paul and Tammy Nipper dig right in to clean debris from the Ocmulgee River.

Affordable Compliance



The Mentone Wastewater Treatment Plant uses two Submerged Attached Growth Reactor (SAGR) beds for post-secondary treatment.

SUBMERGED ATTACHED GROWTH REACTOR TECHNOLOGY HELPS A SMALL COMMUNITY MEET EFFLUENT AMMONIA LIMITS WITHOUT REPLACING ITS LAGOON SYSTEM

By Merle Kroeker, P.Eng. and Kevin Vieira

The Town of Mentone in Kosciusko County, Ind., is known as the Egg Basket of the Midwest. With just over 1,000 residents, Mentone faces challenges common to many other small communities in North America with a dilemma of an aging lagoon-based wastewater treatment facility and new effluent quality limits.

While effluent limits have become stricter in recent years, many communities have struggled to find the technical and financial resources to keep up because technology options for post-lagoon nutrient removal are limited.

Until recently, cost-effective tertiary treatment technologies following cold oxidation ponds or aerated lagoons that can meet low ammonia levels have been rare. Communities had little choice but to abandon their lagoons and construct new mechanical treatment plants, with the accompanying capital and operation costs.

But recent advances in cold-climate nitrification provided the Town of Mentone with an innovative solution for post-lagoon nutrient removal. The community added SAGR (Submerged Attached Growth Reactor) technology to its existing lagoon system to provide nitrification, without taking the existing lagoons offline.

The SAGR system at the Mentone Wastewater Treatment Plant.

PHOTOS COURTESY OF NELSON ENVIRONMENTAL, INC.

Share Your Idea

TPO welcomes news about interesting methods or uses of technology at your facility for future articles in the How We Do It column.

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

UPGRADE FOR AMMONIA

Mentone's treatment facility consisted of a two-cell facultative lagoon system providing secondary treatment. The facility was designed to meet effluent BOD_5/TSS limits of 25/70 mg/L, but it could not meet the NPDES limits for total ammonia nitrogen (TAN) of 9.6 mg/L in summer and 10.4 mg/L in winter.

Nelson Environmental collaborated with the town engineering consultant to design an upgraded system that retained the facultative lagoons for secondary treatment, followed by a SAGR process.

The SAGR is an aerated gravel-bed reactor with a horizontal-flow hydraulic profile. The module provides year-round nitrification well beyond most total ammonia permit requirements for influent water temperatures as low as 32.9 degrees F, making it well suited for post-lagoon treatment in cold climates.

An added benefit is effluent polishing to BOD_5/TSS levels to less than 10/10 mg/L. In addition, test data from a demonstration facility in Lloydminster, Alberta, showed significant (greater than 90 percent) reduction of fecal coliform to less than 200 CFU, in some cases making additional disinfection unnecessary.

SIMPLE SYSTEM

The SAGR process is simple to operate. There is no solids return to monitor and adjust and no sludge to waste and handle. The operations and maintenance process is similar to that of a conventional diffused-air aerated lagoon. It is estimated that over the long term, the operator of the Mentone facility will spend an average of 30 minutes per day doing a systems check (visual inspection) and maintenance.

The only moving parts in the system are the blowers supplying oxygen to the SAGR process. A simplified control scheme manages the day-to-day operation of the blowers. The SAGR system at Mentone is comprised of two beds in parallel, each handling 50 percent of the hydraulic loading.

The SAGR process was developed mainly to provide post-lagoon ammonia removal without abandoning existing lagoon treatment. Performance parameters and sizing for the process are based on extensive testing performed on the post-lagoon SAGR in Lloydminster and a demonstration unit that was located in Steinbach, Manitoba.

The process can be used for nitrification following any secondary treatment process, including aerated or non-aerated lagoons. The clean gravel bed has a horizontal-flow distribution chamber at the front end to distribute the influent wastewater across the width of the entire cell.

SAVING ENERGY

The aggregate is submerged, providing the necessary surface area for growth and attachment of a nitrifying biomass within the bed, and it is sized to optimize bacterial growth and hydraulic flow. A horizontal effluent collection chamber at the back end collects the treated effluent and channels it to the discharge structure. Sizing of the bed is based on influent flow and loading rates, expected influent water temperature, and the required rate of nitrification.

Using the facultative lagoons for secondary treatment and the SAGR process for nitrification and BOD/TSS polishing will lead to an estimated 50 percent operation and maintenance savings compared to a fully mechanical aerated treatment system.

In Mentone, no aeration was required in the lagoons to meet the recommended lagoon effluent BOD_5 feeding the SAGR process. The blowers for the SAGR are sized to meet the oxygen requirements for nitrification and final BOD polishing only. This saves significant energy that would be required to run blowers for a conventional aerated lagoon system.

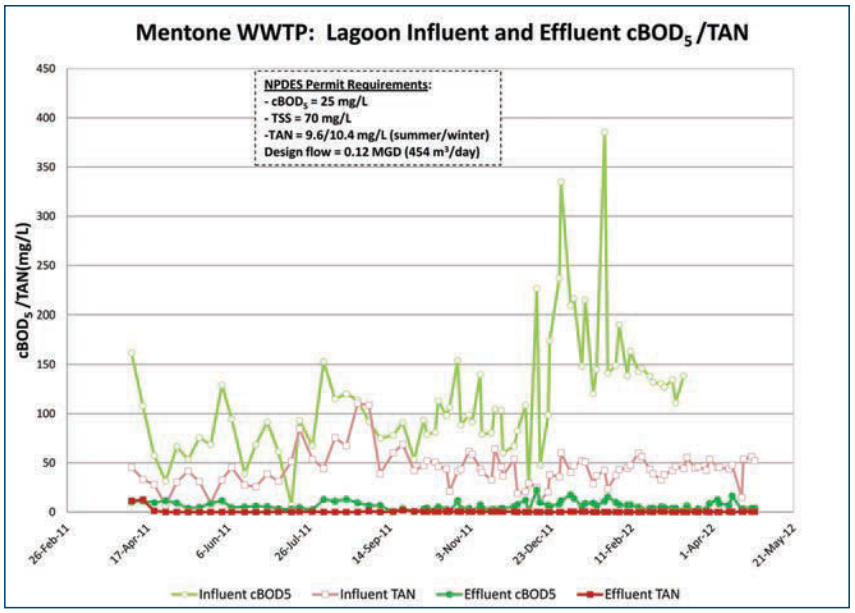
It is estimated that this design saves 50 percent on energy versus other systems achieving similar effluent quality. The trade-off is the higher lagoon footprint required for the necessary residence time. Since the capacity was available at the onset of the Mentone system design, the most cost-effective approach was to use the existing lagoon infrastructure. This provided cost savings in both construction and long-term operation and maintenance.

GETTING GOING

Nelson Environmental provided system commissioning and operational training in March 2011. After a two-week startup window, the Mentone facility is producing effluent averaging 6.5 mg/L BOD, 3 mg/L TSS and 0.3 mg/L TAN year-round. The system design flow is 0.12 mgd.

The facility upgrade using the SAGR process enabled the town to surpass current NPDES requirements. Using the facultative lagoons for secondary treatment and the SAGR process for nitrification and BOD/TSS polishing will lead to an estimated 50 percent operation and maintenance savings compared to a fully mechanical aerated treatment system.

The upgraded system in Mentone provides an example of a cost-effective solution for wastewater operators who face the same regulatory challenges and want to keep their existing lagoon system while maintaining low operation complexity.



Mentone Wastewater Treatment Plant Lagoon Influent and Effluent $cBOD_5$ and TAN Data in 2011-2012.

ABOUT THE AUTHORS

Kevin Vieira is involved with client services and Merle Kroeker, P.Eng., is a project development engineer with Nelson Environmental, a provider of water and wastewater solutions based in Winnipeg, Manitoba. The company can be reached at info@nelsonenvironmental.com. **tpo**

Knowing What's Coming

INDUSTRIES ARE NOT THE ONLY SOURCES OF DISCHARGES THAT CAN UPSET TREATMENT PLANTS. RESIDENTIAL ABUSERS CAN HAVE BIG IMPACTS, TOO.

By Ron Trygar

It seems many wastewater operators don't get the opportunity to go out into the community and visually inspect the collection system that conveys sewage to their plant.

We drive to the treatment plant on the surface of roads that cover the gravity sewer lines and force mains buried below. During our shift at the plant, we treat the entering waste flow without really knowing where it came from, who sent it to us, or even what's in it.

Several treatment plants I worked at would get various colors of wastewater (red, black, pink) entering the headworks. We kept small plastic sample bottles near the bar screen to capture the unusual waste for lab analysis. Of course, industrial and commercial users contribute all kinds of interesting waste to the collection system, but what about the residential users?

Being a regular contributor to *TPO* Lab Detective allows me to share some of the more unusual situations I have experienced. In this installment, I'll share a few short stories that allowed a few friends and me to put on the Lab Detective cap and get to know the dischargers.

HAPPY THANKSGIVING!

As deep fat turkey fryers become more popular each year, residents sometimes face the dilemma of what to do with 7 to 8 gallons of used cooking oil once the Thanksgiving holidays have passed. Some ingenious homeowners have discovered that the 3-inch PVC clean-out cap sticking up in the yard is conveniently connected to the local sewer system.

PHOTO COURTESY OF RON TRYGAR

Cooking oil enters a clarifier and rises to the surface.

What better way to dispose of all that used oil? Down the drain goes all that oil and chunky food waste. Some folks say, "It's only a few gallons — what harm could it do once it's mixed with millions of gallons of wastewater?" The fact is that many residents dispose of cooking oil down clean-outs and sink drains, and this accumulation of oil and grease is very detrimental to the wastewater collection system and treatment plant.

When the oil reaches the treatment plant, it collects on the surface of aeration tanks and the primary and secondary clarifiers, and it can also coat the fragile membranes of today's membrane bioreactor (MBR) treatment units. Once oil and grease enter a plant, problems can arise: foaming in the aeration tanks, excessive *Nocardia spp.* bacteria growth, turbid effluent, equipment malfunctions, and more. Aerobic and anaerobic digesters experience excessive foaming and frothing as well.

How to stop this crisis? Public education, developing and enforcing local sewer use ordinances, and grease trap inspection and pumping programs are just a few places to start, but beware: this is a never-ending battle!

What's Your Lab Story?

The Lab Detective feature in *TPO* will help operators learn analytical techniques that help diagnose and solve treatment problems. Are you struggling with a process issue?

Send a note to editor@tpomag.com. Your question may become the topic of a future column.

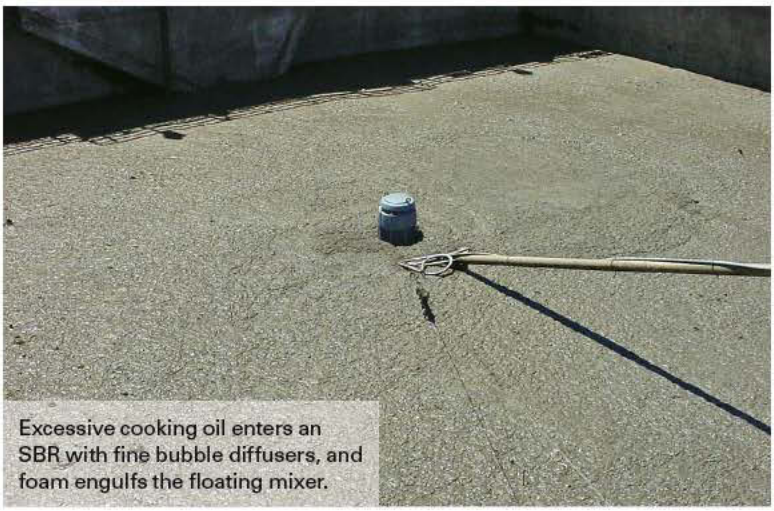
GOT METH?

Here in America we continue to see a rise in the use of drugs, both legally prescribed and illegally manufactured and sold. Enter the do-it-yourself meth lab. Ordinary household chemicals and cold medicines are being converted into methamphetamine, or meth for short.

Some wastewater operators in the heartland of America have asked me what the dumping of meth lab waste would do to the treatment plant biomass. They see the effects of these toxic mixtures on the treatment plant, especially after the police have raided suspected home labs.

In doing research for this article, I learned quite a bit about methamphetamine. It appears that a change in manufacturing processes used in small home labs require much less of the chemicals that might be used by larger meth labs producing drugs on a mass scale. The term 'shake and bake' is often used to describe the use of small plastic bottles to produce meth crystals.

In the past, large quantities of chemicals were needed to make the same amount of the drug, and the disposal of the waste product into the sanitary sewer system seemed to be causing difficulties at treatment plants. Anhydrous ammonia used as fertilizer on farmland



Excessive cooking oil enters an SBR with fine bubble diffusers, and foam engulfs the floating mixer.

was one of these chemicals, and theft of ammonia from tanks left on farmer's fields has increased.

The high levels of waste ammonia discharged into the sewer system along with other hazardous substances create a high-strength, or even toxic waste to the fragile microorganisms.

SEEKING REMEDIES

How do you detect or verify that meth chemicals are affecting your treatment plant? Have an open discussion with your local law enforcement officials. Tell them your concerns; ask if they think the possibility of a meth lab exists and where they suspect it might be located.

Some wastewater operators in the heartland of America have asked me what the dumping of meth lab waste would do to the treatment plant biomass. They see the effects of these toxic mixtures on the treatment plant, especially after the police have raided suspected home labs.

Next, if the indicated location is on the municipal sewerage system, collect samples from nearby manholes and check for elevated levels of the suspected pollutants. A portable composite sampler that fits into a manhole works great for this purpose, and you can rent one from a local lab or wastewater supply house.

Alternatively, you can set up a sampler at a nearby lift station, or collect a series of manual grab samples and combine them into a composite sample. If you find the suspected pollutant (ammonia, for example) at higher levels than in background samples, you have narrowed down your source location.

Share this information with law enforcement officials or local environmental regulatory agencies, especially if the illegally dumped waste is affecting the treatment plant's operation.

These are just two of the many stories operators from all over the country have shared with me. Whatever your particular situation may be, take heed: You are probably not alone! Please feel free to share your stories with me at the email address below.

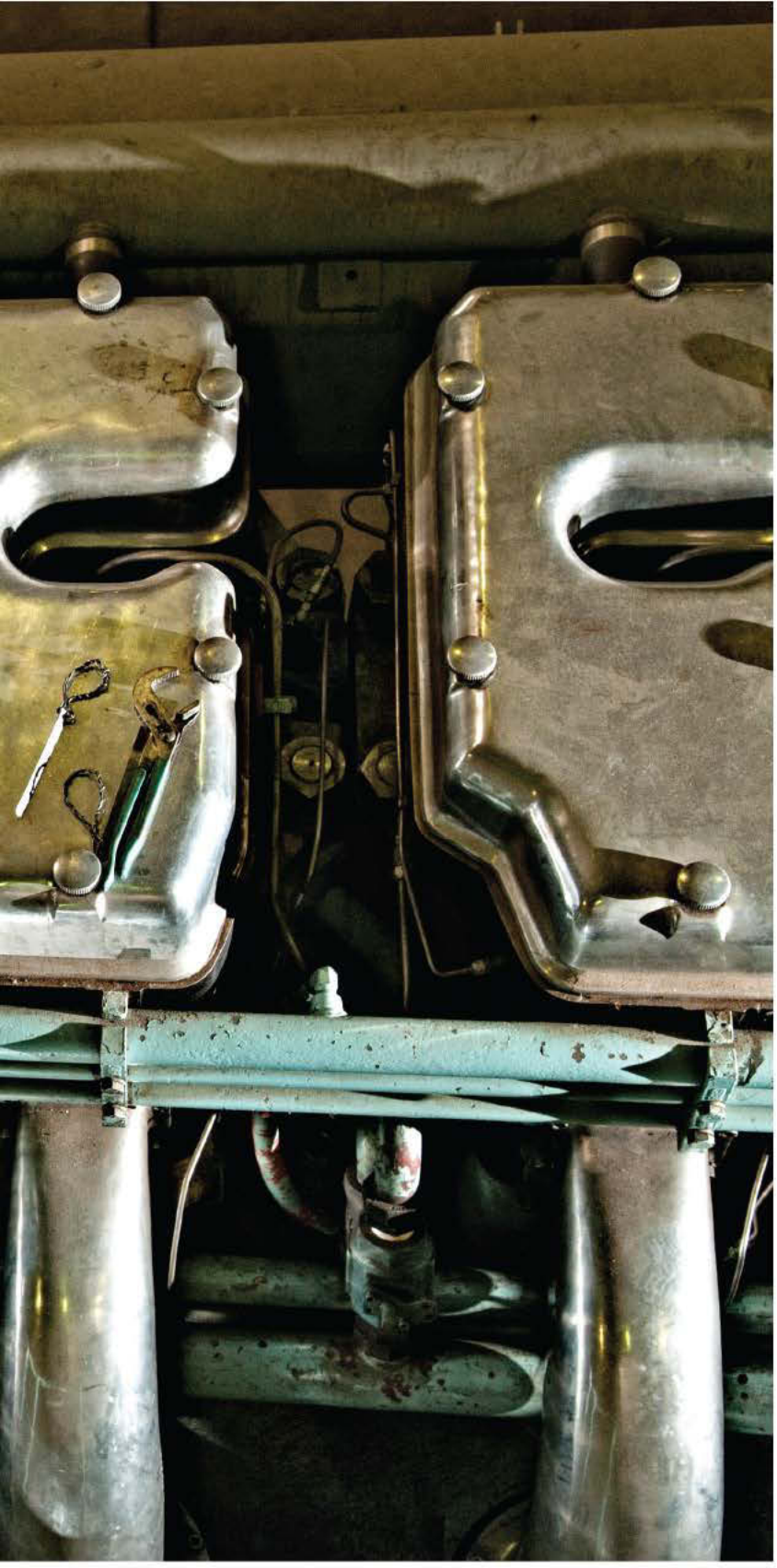
ABOUT THE AUTHOR

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**

A CALIFORNIA WASTEWATER TREATMENT PLANT USES HAULED-IN HIGH-BOD WASTES TO MAXIMIZE BIOGAS PRODUCTION AND GENERATE MORE POWER THAN IT USES

Beyond *Net Zero*

By Doug Day



Power plant mechanic/operator Neil Marvin services one of four diesel engines at the East Bay Municipal Utility District wastewater treatment plant. (Photography by Keith Dixon)

BY 2020, THE EAST BAY MUNICIPAL UTILITY DISTRICT wastewater treatment plant could be selling twice as much electricity as it uses.

With the addition of a new high-efficiency biogas-fueled turbine in early 2012, the plant in Oakland, Calif., is already selling excess electricity. The district is probably the first water or wastewater utility in the nation to sell excess electricity produced solely from waste material back to the grid.

Over the last 10 years, EBMUD has been updating the plant and expanding efforts to take full advantage of biogas resources. "It's exciting," says Dave Allen, power plant supervisor. "Every time I give a tour, people say 'You've got to be kidding me.' They think we just treat toilet water. They're shocked at what we're doing with electricity."

The initiative was the brainchild of wastewater director Dave Williams, whom Allen credits with driving the idea now called 2x20: two high-efficiency biogas-driven turbine generators by 2020. Biogas turbine fuel comes in large part from high-BOD food and process wastes trucked to the plant and added to the digesters.

EXCEEDING PLANT DEMAND

The new high-efficiency turbine is a Mercury 50 model from Solar Turbines of San Diego, rated at 4.5 MW. While the typical turbine is 25 percent efficient, Solar rates the Mercury 50 turbine at 38 percent efficient. The company developed it as part of the U.S. Department of Energy's Advanced Turbine System Program.

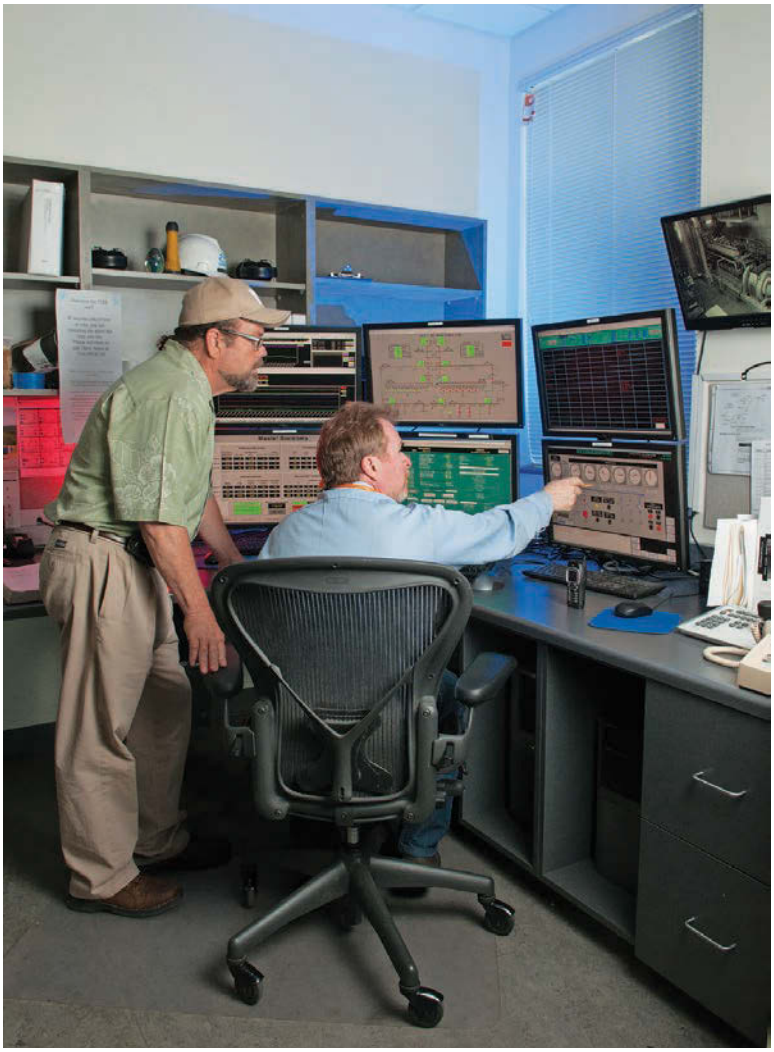
Solar says it has the highest electrical efficiency for a gas turbine its size, along with ultra-low emissions. The plant's emission permit allows 20 ppm for NO_x; the turbine actually produces about 7 to 8 ppm. The turbine is supplemented by three 2.1 MW, 3,000 hp Enterprise engines installed in 1985, giving the plant the capacity for about 10 MW of electrical generation fueled by biogas.

The engines used to generate about half the plant's electric power. The turbine quickly showed its potential: Over two days starting last Feb. 1, the plant's generation consistently exceeded its demand by about 2 MW, allowing EBMUD to sell excess power back to Pacific Gas and Electric, the local power company. "From March to October, our wastewater plant runs on 4.5 MW of electrical demand," says Allen. "Our power plant is producing anywhere from 4 to 7.5 MW." It normally produces about 6 MW or higher.

profile

East Bay Municipal Utility District wastewater treatment plant, Oakland, Calif.

BUILT:	1950 (secondary treatment added 1969)
POPULATION SERVED:	1.5 million in 9 cities
FLOWS:	70 mgd average, 168 mgd secondary treatment design, 320 mgd primary treatment design
TREATMENT LEVEL:	Secondary (1 mgd tertiary for reuse)
TREATMENT PROCESS:	Pure oxygen activated sludge with cryogenic reactors
RECEIVING WATER:	Pacific Ocean
BIOSOLIDS:	Land application, landfilling
EMPLOYEES:	100 (50 operators)
ANNUAL BUDGET:	$60.7 million
WEBSITE:	www.ebmud.com
GPS COORDINATES:	Latitude: 37°49'29.34" N; Longitude: 122°17'33.48" W



Power plant supervisor Dave Allen, left, and power plant mechanic/operator Neil Marvin review the plant's SCADA monitors.

With the turbine, the plant is generating around 15 percent more power than it uses per year, and that is expected to grow to 25 percent or more in two years as the district's food waste program continues to grow.

Electricity sales are bringing in the equivalent of about $500,000 a year in revenue, and EBMUD is seeking some long-term contracts to sell its electricity to area businesses and industries that could double that amount. Income from waste hauled to the plant's digesters is about $8 million. Tipping fees range from 3 to 11 cents per gallon for liquids; food wastes, which require much more handling, have tipping fees from $30 to $65 per ton. In addition, the plant is saving about $2.5 million a year in electricity bills at today's rates.

DRIVEN BY CHANGE

When EBMUD began using biogas to generate electricity in 1985, the community had a much different industrial makeup — the plant served a dog food factory, several food processing companies, canneries and other food producers. That much BOD load coming into the headworks ultimately provided about 1,200 scfm of biogas from the digesters. When those industrial customers later closed down, gas production fell off to 800 to 900 scfm.

After a few years of studying ways to increase organic loading, EBMUD started a Resource Recovery (R2) program in 2002 to increase biogas production by adding fats, oil and grease (FOG) and high-strength waste to the digesters.

The program is managed by Sophia Skoda, a senior civil engineer. "We were put in a position where we had to either raise rates because of the departure of the large commercial customers, or we had to figure out some creative ways to use our capital and labor," Skoda says. "There were septage and FOG trucks looking for a place to go, and that's how it really started."

Neil Marvin checks one of the biogas-driven turbine generators (Solar Turbines) that convert biogas to electricity.

Allen adds, "Right now, we're averaging 1,900 to 2,000 scfm of biogas." That is expected to increase to around 2,700 scfm with some operational changes this year, including blending tanks, and passive overflow digesters to allow the addition of biosolids and more hauled waste to the digesters. "We found that pumping all of that product straight into a digester makes gas production go through the roof," says Allen.

> "We have a very stable BOD load in the influent now. All the high-strength waste goes straight to the digesters, so we have a little more luxury on the secondary treatment side. We don't have to worry about too many large spikes of BOD coming in."
>
> **JOHN CLOAK**

A BOON FOR TREATMENT

The loss of BOD in the influent reduced biogas production but helped the plant's treatment process. "We have a very stable BOD load in the influent now," says shift supervisor John Cloak. "All the high-strength waste goes straight to the digesters, so we have a little more luxury on the secondary treatment side. We don't have to worry about too many large spikes of BOD coming in."

Skoda says operators were a bit hesitant as, 10 years ago, the plant began adding more and more hauled waste to the digesters and began operating outside the normal parameters. "We have mini-upsets," she adds. "It used to be a nerve-wracking thing. But the operators have gotten very good at spotting trends and figuring things out."

The 70 mgd (average) treatment plant uses a pure oxygen activated sludge process operating one of two cryogenic reactors at any given time. Cloak notes that pure oxygen plants like EBMUD's have a tendency to promote filament growth. "We combat that by running a low MCRT/SRT [mean cell resident time/solids retention time]," he says. "I'm able to do that because I don't have large BOD loads coming into the front end of the plant."

CHANGE IN DIGESTION

The 11 digesters all had floating covers until recently, when they were replaced with fixed covers. "At the same time, we moved from the mesophilic

(continued)

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DAVE ALLEN

The EBMUD power production team includes, from left, instrument technician Mike Takacs, electrician Leroy Lowe, power plant mechanic/operator Neil Marvin, electrician Bart Murray, power plant supervisor Dave Allen, and plant electrical maintenance supervisor Richard Treadwell. They are shown with a high-pressure gas compressor (Toshiba) for one of the treatment plant's biogas-driven turbines.

to the thermophilic range on all the digesters — generating gas is all about organic loading," says Cloak.

"While thermophilic digesters may have a tendency to be a little harder to dewater, they seem to be able to take a pretty high organic loading. We bring in some wastes with high BOD values and put it straight into the digesters with the idea of producing more and more methane. They've handled it pretty well."

It is difficult to add large organic loads to mesophilic digesters because volatile acids will increase, making the digesters sour faster. "The thermophilics can take a pretty good hit," says Cloak. "I may run outside my alkalinity-to-volatile-acids ratios, but it's short-term, and it recovers fast. I still watch the chemistry on them, but they can take the loading, produce the gas, and not have the tendency to upset like mesophilics."

Despite the unusual chemistry, treatment levels are still well within normal parameters: quite often in single digits for effluent BOD and TSS discharged to the Pacific Ocean. Ammonia limits are less stringent than for a plant discharging to inland waters.

Cloak says the operations team also learned some lessons about the intricacies of high organic loading. "On a gas flowmeter, you might see a huge increase in immediate gas production," he says. "But sometimes, large volumes don't necessarily mean high-Btu fuel. That first stage of digestion with some wastes produces huge amounts of carbon dioxide, and you can't burn that."

Over the years, the plant has added 190,000 cubic feet of Dystor gas holding systems (Siemens Water Technologies). The first one went in 15 years ago because there were times when there wasn't enough gas to run all the engines, and some gas was lost through flaring. The first Dystor system helped increase electrical output at the time by 40 percent.

BENEFICIAL BIOSOLIDS USE SINCE 1994

The East Bay Municipal Utility District in Oakland, Calif. produced 78,800 wet tons of biosolids in 2011 at its water and wastewater plants. The Class B biosolids are all beneficially reused; 32 percent was used as a soil amendment at non-food crop farms in Merced County and 68 percent was used at local landfills as daily cover material. The addition of new dewatering centrifuges in 2011 reduced the amount of biosolids being hauled from the plant by 15 percent, saving $400,000 in shipping costs by increasing the solids concentration from 21 percent to 25 percent.

EBMUD is one of just 29 agencies in the country with a biosolids management plan certified by the National Biosolids Partnership. It was also the first in the nation to receive approval from the U.S. Environmental Protection Agency's pathogen and metal concentration reduction program. All metal concentrations are well below EPA limits and fecal coliform levels averaged 0.0009 MPN/g, well below the regulatory limit of 2 MPN/g.

A new digester dedicated to hauled food waste is currently under consideration at EBMUD's wastewater treatment plant. All biosolids from that are intended for Class A use as fertilizer and other consumer uses.

The EBMUD digesters use Dystor gas holding systems (Siemens Water Technologies).

East Bay Municipal Utility District Wastewater Treatment Plant PERMIT AND PERFORMANCE			
	INFLUENT	PERMIT*	EFFLUENT
CBOD	272 mg/L	25 mg/L	9 mg/L
TSS	324 mg/L	30 mg/L	12 mg/L
Ammonia nitrogen	–	84 mg/L	20-40 mg/L
pH	7.9	6-9	6.6

** Monthly average maximum*

SEEKING MORE WASTE

When the high-efficiency turbine was added this year, the infrastructure was built so that a second 4.5 MW turbine could easily be added. "All the breakers were installed, the pad was poured, and everything is ready to receive the second turbine," says Allen. That would increase total generating capacity to about 15 MW and give the plant the potential to sell twice as much electricity as it uses.

After the second turbine, the total required biogas flows would be about 4,000 scfm, according to Allen. EBMUD is taking steps to ensure that gas supply by expanding its R2 program to attract more FOG and high-strength waste to feed the digesters. "We have trucks coming from as far away as Bakersfield, about a 300 mile round trip," notes Allen.

Wastewater plant operator Huong Ton collects screened material for landfilling.

The R2 program materials include chicken blood from a poultry processor, waste from wineries and dairies, septage from septic tanks, pumpings from portable restrooms, animal processing and rendering waste, water and wastewater sludge, and other commercial and industrial process wastes.

The number of customers varies greatly — for example, winery waste is highly seasonal, and dairy waste varies in character based on the market for byproducts. "We have received up to 20 trucks per day of FOG and have had hundreds of other customers with dairy, winery and other wastes that need to be disposed of in an environmentally friendly manner," says Skoda.

FACING CHALLENGES

She says each type of waste has its own challenges. FOG has high levels of contaminants, as does food waste, which tends to include plastics and silverware. "You have to watch things, but it's been working out for us," says Skoda. "With chicken blood, we can get a lot of feathers, and wastewater plants are not used to dealing with feathers. Winery waste has grape stems. It's not easy, but we think it's the right thing and worth doing."

The plant also plans to add what Allen calls a Lettuce Digester, designated just for food waste. That would encourage people to buy the biosolids for fertilizer or compost.

Some people are reluctant to use biosolids that come from sewage. "But they like the idea if it comes from food alone and was segregated from other biosolids," says Skoda.

EBMUD continues to work on its policies and standards for accepting hauled wastes and continues to work with regulators, because sometimes there is a lack of clarity over what is allowed and which agency has authority over different waste streams.

Skoda likens it to doing research and development in real time. "That's what we do in the San Francisco Bay Area, that's our culture," she says. "Some people work on computer chips; we work at a wastewater treatment plant. Our ratepayers, through our elected board of directors, are looking for us to be innovative, do the right things for the environment, and be effective and efficient."

Cloak isn't certain yet how much loading the digesters will take, so he continues to be careful. "I've seen the ammonia run up higher than the textbook numbers, but the pH keeps us from getting into trouble with ammonia toxicity," he says. "We tend to have a little higher alkalinity also. We've pushed the limit quite a bit, sometimes to the point of nervousness, but so far it's been pretty good. Our sampling and lab work is the key to keeping things under control." **tpo**

more info:

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A MASSACHUSETTS TREATMENT PLANT TAKES ADVANTAGE OF FEDERAL STIMULUS FUNDS TO HELP PAY FOR A $22 MILLION UPGRADE THAT INCLUDES RENEWABLES AND ENERGY EFFICIENCY

By Doug Day

"We're in the business of cleaning the environment," says Mark Young, executive director of the Lowell (Mass.) Regional Wastewater Utility. "We want to be an environmentally progressive city where people want to live and work."

With an investment of $22 million, including $4.66 million in federal stimulus funds, the city's wastewater plant has improved its aeration system, installed active solar heating and photovoltaic systems, and installed green roofs and other stormwater mitigation strategies.

The project aligns with the vision of city manager Bernie Lynch: "The reason for the wastewater plant is to produce clean water for a safer and better environment. Sooner or later, we have to replace roofs, windows and heating systems. This gets it all done, and it's paid for by the savings."

The 32 mgd (design) activated sludge plant, now with a staff of 48, went online in May 1980 to serve 180,000 people in Lowell and four neighboring communities. While the average flow is about 26 mgd, wet-weather flow from combined sewers can reach 110 mgd. The utility has just begun work to separate the sewers and eliminate overflows to the Merrimack River watershed.

STARTING WITH AERATION

The upgraded plant began operating with a new fine-bubble aeration system in November 2011. One 500 hp and three 350 hp centrifugal blowers were replaced by four 300 hp energy-efficient turbo blowers from HSI Blowers. "We were very vulnerable," notes Young. "We were not in a good place. The old blowers were unreliable, expensive to maintain, very loud, and energy inefficient."

Besides a huge improvement in reliability, the plant will see electrical savings of about $75,000 a year at current rates. "We had visited some facilities where these turbo blowers were installed and realized that it was a good investment," says Young. Also included in the upgrade was an overhaul of the entire electrical system.

Photovoltaic systems were installed to reduce power demand from the local utility. Half of the administration building roof houses a 1,080-square-foot, 33 kW photovoltaic array, while another 15 kW system covers 2,400 square feet of the maintenance building roof. The renewable energy is expected to save $3,330 a year.

PHOTOS COURTESY OF LOWELL REGIONAL WASTEWATER UTILITY

Every building at the Lowell Regional Wastewater Utility has a green roof. The soil and vegetation provide insulation and reduce stormwater runoff.

STORMWATER MANAGEMENT

To reduce runoff from the property, the upgrade included 14,600 square feet of green roofs on all five plant buildings. Green roofs use soil and filtering media to grow vegetation, which also provides insulation, reducing heating and cooling needs.

Lowell uses two kinds of green roofs. There are four "extensive" roofs with soil 1 to 5 inches thick for low-growing grasses, and one "intensive" roof with about a foot of soil to grow flowering plants and shrubs. "We have blueberry bushes growing on ours," notes Young.

The 6,300-square-foot intensive roof and photovoltaic system on the administration building are accessed by an exterior stairway to accommodate public tours. A 1,950-gallon cistern collects water that isn't absorbed by the green roof, and it is used for landscape irrigation.

Pervious asphalt and concrete were added to three parking areas to further reduce runoff. Rainwater drains through the pavement and is naturally filtered by the soil before returning to the ground-

(continued)

LEFT: Rain gardens help treat stormwater and serve as examples to the public about how rain gardens can be used at their homes. RIGHT: This 2,500-square-foot rain garden naturally treats stormwater from pavement around the influent pump building.

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water. "I was skeptical, but I poured a five-gallon pail of water on the concrete, and it went through it like a sponge," says Young.

The property also includes two rain gardens. A 375-square-foot garden outside Young's office is mainly for appearance and demonstrations. A 2,500-square-foot rain garden handles runoff from pavement in front of the influent pump building. "We wanted to be able to showcase the wastewater department as a municipal entity that initiated all these green projects," he says.

REDUCING ODORS

Green innovation also extends to the plant's biosolids operation. Biosolids are composted in Maine or landfilled in Vermont. Until the recent upgrade, primary and secondary sludges were co-thickened in three gravity thickeners. "In the summertime, it would come alive because we, in essence, were mixing food and bugs," says Young. "It would spill over into the wet well and make its way to the aeration system and load it up with BOD, causing a lot of process upsets."

There had been many odor complaints over the years, so the project converted one of the gravity thickeners to a thickened waste activated sludge tank with a roof and a rotary drum thickener (RDT) for secondary sludge, which was enclosed in a building.

> "We wanted to be able to showcase the wastewater department as a municipal entity that initiated all these green projects."
>
> **MARK YOUNG**

"We combine 20 percent secondary sludge from the RDT, 60 percent primary sludge from the gravity thickeners, and 20 percent septage and pump it to the belt filter presses for dewatering," Young explains. "It helps with odors and our secondary treatment process."

The chemical system for the belt filter presses was also improved to enhance conditioning of the biosolids and maximize dewatering with lower chemical dosing. Since the upgrade, the plant has had only one odor complaint.

The septage receiving station was also relocated and modernized. "We wanted to be able to get trucks in and out of here quicker, accommodate haulers' needs, and make it more attractive to them so that we could increase our revenue," says Young.

Two photovoltaic systems on building roofs are expected to save more than $3,000 a year in electricity costs.

Two solar walls help the Lowell Regional Wastewater Utility cut natural gas usage for heating two buildings. Together, they saved the utility more than $13,000 in one heating season.

SOLAR WALLS CUT GAS USAGE

The Lowell Wastewater Treatment Plant heats two of its buildings using solar walls, also called Trombe walls. Simple to build, they collect heat during the day. "They look almost like the video scoreboard at Fenway Park," says Mark Young, executive director of the Lowell Regional Wastewater Utility. "When the sun hits them, they generate a lot of heat." A 1,102-square-foot solar wall from Conserval Engineering of Buffalo, N.Y. is on the influent pump building. Environmental Solar Systems of Methuen, Mass., supplied two 18.75-square-foot solar walls for a small hauled waste handling building.

Many solar walls are passive: The warm air they create radiates through a room or building with no mechanical assistance. The solar walls at Lowell are active in that the heat is used to warm air in a system of pipes behind the wall. Thermostats control blowers that distribute the warmed air.

The system is almost maintenance-free aside from periodic cleaning, but "very effective," says Young. The plant saved $13,500 in natural gas in the winter of 2010-11. "Now I wish we could have added them to the maintenance and effluent buildings," he adds. "We will if we get some grant money in the future."

GOING CITYWIDE

Along with the investment at the wastewater plant, Lowell has invested in other city operations. "We have a performance energy contract with Ameresco who did an energy audit of all our municipal facilities," says Lynch.

The improvements have included lighting retrofits, solar panels and new heating systems. "They are making improvements to the buildings to make them less costly and more environmentally sustainable and it's paying for itself," Lynch says. **tpo**

What's Your Story?

***TPO* welcomes news** about environmental improvements at your facility for future articles in the Greening the Plant column. Send your ideas to editor@tpomag.com or call 877/953-3301.

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Energy Management and Sustainability

By Briana Jones

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A directional air shroud and flywheel keep pump temperatures low, and professional-duty Ultimate Blue synthetic pump oil protects pistons, crankshaft, bearings, rings and cylinders through a splash lubrication system. **814/445-3400; www.steamjenny.com.**

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EXELYS thermal hydrolysis system from Kruger USA

The EXELYS thermal hydrolysis system from Kruger USA, used with the company's DLD (digestion-lysis-digestion) configuration, optimizes energy production and solids reduction. Sludge is fed to the first digester, which can operate in a mesophilic or thermophilic state. The material is then dewatered and fed to the EXELYS system. The heat is recovered for steam generation and heating of the first digester. The hydrolyzed sludge is then digested again in the second mesophilic digester. All solids solubilized in the unit are converted to biogas. **919/677-8310; www.krugerusa.com.**

Endura Series motors from Aqua-Aerobic Systems

HIGH-EFFICIENCY MOTORS

High-efficiency and premium-efficiency Endura Series motors from Aqua-Aerobic Systems are for Aqua-Jet surface aerators and AquaDDM direct-drive mixers. The motors are available in a variety of ratings and provide long-term performance under severe conditions. They require no greasing and limited maintenance for five years, saving energy and maintenance costs. **800/940-5008; www.aqua-aerobic.com.**

SMALL DRIVES

D-Frame VLT drives from Danfoss VLT Drives

D-Frame VLT drives from Danfoss VLT Drives are rated from 125 to 450 hp and require less panel or wall space than previous models, reducing installation cost and increasing installation flexibility. The drives use back-channel cooling to remove 90 percent of the heat generated by the drive, making them well suited for panel buildings.

The drives are available with IP20, IP21 (NEMA 1) or IP54 (NEMA 12) enclosure protection ratings and come with conformal-coated printed circuit boards, which extend drive life and reliability. The units can be factory-fitted with semiconductor fuses to further reduce installation costs. The back-channel cooling concept keeps electronics safely within optimal operation temperatures. **800/432-6367; www.danfossdrives.com.**

Heat recovery exchangers from DDI Heat Exchangers

HEAT RECOVERY EXCHANGERS

Heat recovery exchangers from DDI Heat Exchangers provide non-plug operation despite stringy and sticky materials in municipal sludge. The systems reduce carbon dioxide emissions and provide unobstructed liquid flow. The compact units require a small footprint and provide reliable and maintenance-free operation. **514/696-7961; www.ddi-heatexchangers.com.**

TWO-PASS BOILERS

Series 250 Scotch marine boilers from Hurst Boiler & Welding Company

Series 250 two-pass semi-wetback Scotch marine boilers from Hurst Boiler & Welding Company are available in steam or hot-water versions from 15 to 800 hp with pressures to 300 psig. The two-pass design eliminates refractory baffles between flue gas passes. Efficiencies are equal to three- and four-pass boilers. The units require minimum maintenance and have durable construction for long life. They offer enhanced heating surfaces with rifled tubes.

Features include a large combustion chamber with low heat release; a front-mounted smoke box with slip-on stack connector; access to the fireside with a rear door and split front doors (flame observation ports front and rear); and openings for clean-out inspection of the waterside with 3- by 4-inch handholes and 12- by 16-inch manholes. **800/666-6414; www.hurstboiler.com.**

WASTEWATER PUMPING SYSTEM

Flygt Experior wastewater pumping system from Xylem

The Flygt Experior wastewater pumping system from Xylem includes Adaptive N-technology that allows the impeller to move axially upward when necessary to permit bulky material or tough debris to pass smoothly, reducing stress on the shaft, seals and bearings. The system is available with premium efficiency motors optimized for wastewater pumping, including models with a Line Started Permanent Magnet (LSPM) design. SmartRun intelligent controls enable the system to be pre-programmed and preset for any situation. The controls can reduce energy consumption by 30 percent. **704/409-9700; www.flygtus.com.**

SELF-PRIMING PUMP

Flowserve MPT pump

The Flowserve MPT self-priming solids-handling pump provides reliable performance while offering versatility, ease of maintenance and low cost of ownership. The pump can pass solids up to 3 inches and handles dirty, gritty water as well as free-flowing slurries, sewage and sewage sludge.

Features include back pullout design; belt-drive protection; quick-disconnect clean-out; quick, external impeller adjustment; and dual sight glasses. Maintenance can be performed without disconnecting piping. The pump offers high-temperature capability, duty flexibility and portability and is dimensionally interchangeable with other pumps. Reliability features include generous wear allowance, oversized shaft and bearings, solid one-piece flap valve, run-dry capability, oil-lubricated double mechanical seal, and hard-faced mechanical seals. **800/728-7867; www.flowserve.com.**

BOILER CONTROL PANELS

Watchman boiler control panels from MicroMod Automation & Controls

Watchman pre-wired, pre-programmed boiler control panels from MicroMod Automation & Controls allow users to choose a combustion control strategy and combine it with drum-level control or balance-of-plant controls. A color touch screen provides easy setup and operation. Easy-to-use, password-protected setup screens allow entry of combustion and feedwater curves, engineering unit ranges and other commissioning data.

Operating screens provide information such as burner and boiler status, I/O status, boiler efficiency, and running flow totals as well as alarm and event notification and logging. A built-in Web server allows remote monitoring and operation. Digester gas burner control systems and incinerator controls are also available. **585/321-9246; www.micromod.com.**

ORGANIC BIOSTIMULANT

BAE (Biological Activity Enhancer) from Prodex

BAE (Biological Activity Enhancer) from Prodex (wastewater and bioenergy division of JSH International) is a liquid, organic biostimulant derived from peat. BAE provides wastewater treatment plants with a low-cost, organic alternative to maximize efficiency and meet green initiatives. The additive increases microbe activity and populations. The biostimulant boosts biogas production, reduces operational costs, improves sludge settling, enhances TSS and BOD removal, upgrades effluent quality, and reduces chemical needs. **856/234-4540; www.prodexproducts.com.**

ENCLOSED DRIVES

Altivar Plus enclosed drive line from Schneider Electric

The Altivar Plus enclosed drive line from Schneider Electric features the Altivar 61 and 71 adjustable frequency drive/power converter to provide a packaged adjustable speed solution. The drives offer a wide range of power and voltages with an array of options. Altivar 61 variable-torque standard-duty units offer 110 percent current overload for fans, pumps, compressors and screw feeders. They are rated from 125 to 900 hp at 460 VAC or 125 to 800 hp at 690 VAC.

The Altivar 71 constant-torque heavy-duty unit offers 150 percent current overload for mixers, conveyors, hoisting, extruders and cranes. They are available from 100 to 700 hp at 460 VAC or 100 to 700 hp at 690 VAC. The drives include an easy-to-use remote graphic display, slide-out inverter for easy maintenance, 100,000-amp symmetrical short-circuit rating, and swiveling control panel for easy access. **919/266-3671; www.schneider-electric.com/us.**

PUMP TECHNOLOGY

Smart Conveying Technology (SCT) from seepex provides

Smart Conveying Technology (SCT) for progressive-cavity pumps from seepex provides fast maintenance times and low life-cycle costs due to short assembly times, short maintenance downtime, reduced parts costs, and savings in storage and transport. Pumps with SCT do not need to be removed for maintenance, and no dismantling of piping or removal of other equipment is necessary. With an integrated retensioning device, a simple readjustment of the stator increases service life of the stator and rotor. **937/864-7150; www.seepex.com.**

NON-CLOG PUMP

Non-clog pump from Smith & Loveless

The non-clog pump from Smith & Loveless has an oversized, stainless steel pump shaft that minimizes shaft overhang, reducing shaft deflection and increasing efficiency. The pump impeller is designed for maximum efficiency. By trimming the impellers inside the shrouds, the pump leaves the back shroud full diameter to prevent stringy material from winding around the shaft. In wire-to-water efficiency comparisons, a 10 percent differential in efficiency results in less horsepower drawn by the pump and lower CO_2 emissions. Reduced energy demand lowers annual costs. **913/888-5201; www.smithandloveless.com.**

HEAT EXCHANGERS

APV hybrid fully welded heat exchangers from SPX

APV hybrid fully welded heat exchangers from SPX operate under harsh conditions. The units take up one-fifth to one-tenth the space of tubular space heat exchangers. The high-efficiency units reduce weight, ground area, piping and valve costs. They are mechanically cleanable on the tube side. A full range of gasketed semi- and fully welded plate heat exchangers are available. Gasketed units can fit most applications with scalable configurations. Units have heat transfer areas up to 28,000 square feet and flow rates up to 19,815 gpm. **800/828-7667; www.spxft.com.**

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HIGH-HEAD PUMPS

Godwin HL series Dri-Prime pumps from Xylem

Godwin HL series Dri-Prime pumps from Xylem offer high-head capabilities and are designed for jetting and handle raw sewage, sludges and liquids with solids up to 3 inches. The pumps offer discharge head capabilities to 600 feet or 260 psi with a single-stage impeller, automatic priming from dry to 28 feet, diesel or gas engines or electric motors, dry-running oil bath seal with abrasion-resistant silicon carbide interfaces, and cast chromium steel impeller for long life.

Options include diesel engine or electric motor, 316 or CD4Mcu stainless steel pump-end construction for high- and low-pH applications, highway trailer or skid mount for overnight running with fuel tanks, and sound attenuated enclosures. **856/467-3636; www.godwinpumps.com.**

ANAEROBIC DIGESTION SYSTEM

The advanced anaerobic digestion system from Siemens Water Technologies includes Crown disintegration equipment, a Jet Mix hydraulic mixer and the Dystor expandable digester cover. The disintegration equipment disrupts sludge cells to improve gas yield, the mixer lowers energy use and eliminates settling, and the digester cover increases biogas storage and prevents odors. All components can be retrofitted.

Advanced anaerobic digestion system from Siemens Water Technologies

The Crown equipment boosts gas production while the Dystor cover stores up to three times more gas than conventional digester covers. The gas can be used to dry sludge cake when fed to a Siemens sludge belt dryer (SBD), which uses convective, low heat (about 350 degrees F) to evaporate water. By operating at a low temperature, the SBD can use exhaust from a biogas-fueled engine to reduce drying costs. **866/926-8420; www.water.siemens.com.**

BIOGAS CONDITIONING SYSTEM

The BioCNG biogas conditioning system from Unison Solutions economically converts biogas into fuel for compressed natural gas (CNG) vehicles. Biogas is piped to the conditioning system from an anaerobic digester or landfill. Hydrogen sulfide, moisture, siloxanes, volatile organic compounds and carbon dioxide are removed. The fuel is then routed to a CNG fueling station and compressed.

BioCNG biogas conditioning system from Unison Solutions

The fuel contains more than 88 percent methane and meets or exceeds SAE J1616 criteria for CNG fuel. The system produces up to 1,100 gasoline gallons equivalent (GGE) per day. The fuel can also be supplemented or paralleled with natural gas if additional volume is required. Production cost per GGE is $0.65 to $1.15. The fueling station typically includes a compression system, storage tanks and fuel dispensers. **563/585-0967; www.unisonsolutions.com.**

SPEED REDUCERS AND GEARMOTORS

Cyclo 6000 series speed reducers and gearmotors from Sumitomo

Cyclo 6000 series speed reducers and gearmotors from Sumitomo are inline drivers that provide quiet, efficient and reliable performance and enable the drives to withstand momentary overloads exceeding 500 percent of their ratings.

The drives use internal components made of hardened, vacumed-degassed, bearing-grade steel to provide low vibration and noise, low backflash and long life. Standard specifications include a ratio range of 3:1 to 119:1 (single), 104:1 to 7,569:1 (double), and 8,041:1 to 658,508:1 (triple); 10 to 235 hp; and torque capacity of 55 to 603,000 lb-in. **800/762-9256; www.sumitomodrive.com.**

ENCLOSURE AIR CONDITIONERS

Enclosure air conditioners from Thermal Edge provide a closed-loop, temperature-controlled solution for enclosures subject to heat, salt and contaminants. They allow sensitive components and systems to operate within designed parameters. **972/580-0200; www.thermal-edge.com.**

Enclosure air conditioners from Thermal Edge

Floating BioReactor system from TVT-Bio

FLOATING BIOREACTOR

The Floating BioReactor system from TVT-Bio addresses odor control, sludge reduction and electrical cost. It reduces BOD loading by 73 percent and provides pH stabilization. The system can be designed for plant-specific needs. It offers effective DO control, reducing odor complaints and improving work environments. The system can reduce power expense by 30 to 40 percent. Horsepower required for water movement is significantly reduced, saving power. Reduction of BOD and pH stabilization creates a healthy, balanced and sustainable system. **585/264-1058; www.tvt-bio.com.**

PUMP CONTROL PANEL

The ECO SMART STATION control panel from SJE-Rhombus provides a safe, simple, energy-efficient solution for pump control in municipal lift stations. The panel integrates the Energy View controller with the variable-frequency drive technology in a multiple-compartment enclosure to reduce exposure to arc flash and save energy.

ECO SMART STATION control panel from SJE-Rhombus

The controller is powered by kW Logix software, which provides 30 percent energy savings. The color touch-screen HMI provides level control, pump alternation, flow monitoring, data logging, alarm log and historical trending. The auto-tuning function searches for the Best Efficiency Frequency (BEF). During high-flow conditions, the software can switch to PID operation for optimum energy efficiency and resume cycle-based operation when normal flow returns. **888/342-5753; www.ecosmartpanel.com.** tpo

 By Scottie Dayton

Combined heat and power system saves energy

Problem

The aging internal combustion engines at the 26 mgd York (Pa.) Wastewater Treatment Plant raised monthly energy expenditures to $63,000.

Solution

Operators selected a **C1000 and C600 microturbine combined heat and power system from Capstone** that operates on natural gas and on biogas produced at the plant.

RESULT

Compared with the original engines, the side-by-side units produced 40 percent more power using the same amount of natural gas while reducing electricity bills. The plant further reduced operating costs by recovering the microturbine exhaust heat and using it in the digestion process. **818/734-5300; www.capstoneturbine.com.**

Facility captures and refines biogas

Problem

To relieve the strain high energy costs were putting on the city's budget, Dallas (Texas) Water Utilities looked to reduce its electrical consumption by using biogas from the anaerobic digesters.

Solution

Officials worked with **Ameresco** to design, build and operate a **4.3 MW combined heat and power facility** processing 1,200 scfm of biogas.

RESULT

The facility was projected to save the city $1.5 million annually and offset most of the electricity the utility has typically drawn from the grid. **866/263-7372; www.ameresco.com.** tpo

Tree plantings create a pleasant environment around the Traverse City Regional Wastewater Treatment Plant. Plant staff members have volunteered to water the trees until they are well on their way to maturity.

PHOTOS COURTESY OF THE TRAVERSE CITY REGIONAL WASTEWATER TREATMENT PLANT

Tall Tall Trees

PLANTINGS OF WHITE PINES AND WHITE SPRUCES WILL HELP SCREEN THE TRAVERSE CITY TREATMENT PLANT FROM VISITORS TO A HIKING AND BIKING TRAIL BESIDE THE PROPERTY

By Jeff Smith

The Traverse City Regional Wastewater Treatment Plant is an 8.5 mgd (average) membrane bioreactor (MBR) facility that rests on the north shore of Boardman Lake, a major recreation destination in this northwest Michigan city of nearly 15,000.

Between the lake and the treatment plant is a biking and hiking trail that attracts locals and tourists alike. The east side of the plant abuts a popular city park with a public boat launch that serves the community sailing club. A boathouse and boat slips are directly in front of the plant. Homes and businesses also surround the plant, making it a neighborhood landmark.

TREE BUFFER

"We are very much surrounded by the community," says Scott Blair, project manager for CH2M HILL, contract operator of the plant. "I can walk to city hall from here." Public relations and being a good community partner are important parts of facility operations, says Blair. So when a citizen approached the city planner with an idea to plant trees near the plant to buffer the hiking and biking trail, the plant team was eager to help out.

They planted more than 50 white pines and white spruces, each at least 3 feet tall. Most are along a fence between the plant and the trail, but some are on the north side, which faces a city-owned lot slated for future development. Strategically planted near the trees are 20 deciduous Virginia creeper vines that eventually will climb the chain-link fence and further obscure the plant from trail users' view.

The plant paid the $1,500 for the trees and vines out of a Community Involvement Budget. "Although it's a small part of our overall budget, when we come across something that is important and means something to the client, we are happy to apply it that way," Blair says.

> "We are very much surrounded by the community. I can walk to city hall from here."
>
> **SCOTT BLAIR**

KIND ATTENTION

A small news article about the project in the hometown newspaper produced a few citizen volunteers who joined the mayor, the city planner, the fire chief, treatment plant staff and members of the non-profit Traverse Area Recreation and Transportation (TART) Trails organization in a Friday afternoon planting. TART Trails developed and maintains the trail near the plant. "We made a big deal out of it and everyone had fun," says Blair.

Since then, members of the plant staff have volunteered to water the trees until they are firmly on their way to maturity. Although it will be several years before the trees are large enough to provide a significant visual barrier, an eventual secondary benefit will be the absorption and diffusion of odors that might come from the facility.

Planting trees is not the plant's only community initiative. Several years ago, the team helped create a 4- by 6-foot sign near the boat launch at the park next to the plant. The project was sponsored by the Grand Traverse Bay Watershed Center, a non-profit organization, and plant operators helped by designing a diagram on the sign that depicts plant operations.

Blair is proud of his staff's efforts to be good neighbors, but especially of

Plant mechanic Terry Gensler and plant administrative assistant Cynthia Mehigh water newly planted trees.

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.

the cleaner effluent and increased capacity benefits that came from converting the plant to MBR in 2004. "For a while, we were the largest operating MBR in North America," he says.

Further evidence of concern for neighbors is an extensive foul-air containment and treatment system with two geodesic domes that cover former clarifiers next to the park. **tpo**

What's Flushable? What Isn't?

THE PROLIFERATION OF "WIPES" IS CAUSING WIDESPREAD PROBLEMS IN SEWERAGE SYSTEMS. A GROUP IN MAINE IS HELPING LEAD THE SEARCH FOR RESPONSIBLE REMEDIES.

By Ted J. Rulseh

First came baby wipes. Then hand towelettes. Then makeup remover wipes. Disinfecting wipes for the kitchen. Furniture wipes. Protectant wipes for vehicle tires. On it goes. A search on the Wal-Mart website brings up nearly 600 wipes products.

Where do all these wipes go? Some of them — not an insignificant number — get flushed down toilets, where they contribute to home plumbing blockages, septic system trouble, municipal sewer overflows, and increased loading on headworks in wastewater treatment plants.

Personnel at many wastewater utilities are concerned. They include members of the Maine WasteWater Control Association (MWWCA), which has formed a task force to address the issue. Ultimately, the group would like to see wipes products makers create some clarity around which products are flushable and which are not.

At present, the MWWCA believes labeling is inconsistent and consumers are confused. Meanwhile, products get flushed that do not break down in the system the way toilet tissue does (these are called "non-dispersibles"). So clean-water agencies nationally have to spend more labor and money dealing with wipes that they would rather invest in improving their infrastructure.

> "The legislators would say, 'Who's having an issue?' We would say, 'A lot of people.' They would say, 'What's clogging the pumps?' We would say, 'Baby wipes.' They would say, 'Do you have any data?' And the answer was 'No.' "
>
> **SCOTT FIRMIN**

Those active in the MWWCA effort include Scott Firmin, director of wastewater services with the Portland Water District, which operates four wastewater treatment plants, the interceptor system of Portland and collection systems for some surrounding communities. Firmin talked about non-dispersibles in an interview with *Treatment Plant Operator*.

tpo: What specific issues do you see non-dispersibles causing?

Firmin: A lot of these materials are being used in the bathroom, such as to remove makeup or clean fixtures, and then they're getting flushed. When they're flushed, if they don't break down like toilet paper, we generally find them in the system.

At the homeowner level, people find their toilets or the plumbing in their house plugging. People who own septic systems are having issues where the tank inlet or outlet will plug. The items can get into the drainfield if the tank baffles aren't in good condition.

Scott Firmin, Portland Water District director of wastewater services

tpo: What about the effect on municipal sewer systems?

Firmin: We see issues where, during low flows, if you have a pipe that doesn't have the proper slope, or if you have an imperfection that allows clingers, these wipes can build up and cause sanitary sewer overflows during dry-weather conditions. In one location, we've had six overflows from a combined sewer in dry weather because these materials, along with other materials and grease, have plugged a line and backed it up. Other utilities in Maine have had SSOs directly caused by plugged pumps.

tpo: What is the impact on mechanical equipment in collection systems?

Firmin: I was involved in a project at our Cottage Place pump station in Westbrook where we replaced four 125 hp 10-inch pumps, and as soon as the project was done, every time it rained, those new pumps would plug. The station would still pump, but we were literally breaking pumps apart. So we did an expedited project that cost $4 million to put headworks screens ahead of those pumps.

In another case, we had a set of submersible pump stations in three residential neighborhoods in one township where every Friday, we would send a crew out and they would spend the day pulling the pumps, opening the pumps, and pulling the material out.

The pumps started plugging regularly, so we started pre-emptively going out and removing the material.

tpo: How would you assess the cost of this work?

Firmin: We estimated the cost of the labor for doing that weekly, with two people, was in the ballpark of $25,000 to $30,000 a year. So we decided to replace the submersible pumps. We spent $50,000 upgrading those pump stations.

The Portland Water District is the largest wastewater utility in the state, and we have the resources to make that kind of investment to offset the labor cost. But a lot of smaller utilities don't have the funds to do those upgrades, and their only recourse is to keep sending people out there. No utility is excited about raising rates. We're all struggling to replace aging infrastructure, and we really ought to be putting our money into that, not going out and unplugging the same pumps every Friday.

(continued)

"It's too easy to say, 'Educate the consumers.' Who's going to educate them? If I don't have time to unplug pumps, I certainly don't have time to call everybody and ask them not to flush wipes."

SCOTT FIRMIN

tpo: Are there issues at the wastewater treatment plant level as well?

Firmin: At the plant level, people are also finding these wipes in their pumps. We've found them in the draft tubes in our secondary clarifiers. At one plant, we used to have 3/4-inch screens, so a lot of that kind of material got through.

We've since upgraded, and the material is now being removed, but even when it's removed by a screen, there's still the disposal cost, the management cost, and the upkeep on the screening equipment.

tpo: Do you see the trend toward more non-dispersibles continuing?

Firmin: There's a group called INDA that is the national trade association for manufacturers of nonwoven fabrics. We've seen data that INDA has put out indicating that over the next several years, they expect the sales of wipes to increase by two to four times. People like these products. They're not going away. We don't want them to go away. We just want them to be friendlier to our sewers and more rapidly disperse.

tpo: Is the concern widespread in the clean-water industry?

Firmin: Yes. We started hearing more and more about this issue through the MWWCA. Ultimately the association sent out a survey. Ninety percent of respondents to that survey indicated they had experienced some sort of issue with their equipment or process as a result of non-dispersible products.

tpo: What has the Maine association done to address this issue?

Firmin: As a result of that survey back in 2011, the MWWCA supported state legislation asking for proper labeling of these materials. Manufacturers started putting the word "flushable" on some products, and we felt that was confusing consumers.

We were looking for clear labeling of products and for manufacturers to follow the standard they had developed. If they were labeled as flushable, we wanted them to meet the flushability guidelines INDA has developed. Essentially, the product has to become unrecognizable in a reasonable period of time, it has to pass through plumbing, and it can't cause interference with sewage systems. In other words, it has to act like toilet paper and disperse easily.

Our proposed legislation in Maine would have required that they very clearly label what's flushable, and very clearly label what's not flushable. If it was to be labeled flushable, it would have to meet the INDA guidelines. INDA is working on Edition 3 of these guidelines that will be more stringent than the current version, and the wastewater industry is urging INDA to include a requirement for more rapid dispersibility.

tpo: What happened to this proposed legislation?

Firmin: Last January, the Maine legislature voted that the legislation ought not to pass. I learned through the experience. The legislators would say, "Who's having an issue?" We would say, "A lot of people." They would say, "What's clogging the pumps?" We would say, "Baby wipes." They would say, "Do you have any data?" And the answer was "No." The legislature did write a letter to the MWWCA and INDA asking us to continue working together on the issue.

During the process, we learned that similar legislation had failed in California and New Jersey. So we reached out to find out who was involved. We connected with Nick Arhontes, who is the director of collection facilities operations with the Orange County Sanitation District in California, and with Rob Villee of the Plainfield Area Regional Sewerage Authority in New Jersey, who chairs the Water Environment Federation Collection Systems Committee. Ultimately, I was asked to join the Collection Systems Committee and to become part of an MWWCA Flushables Task Force.

tpo: What has the Maine group done since the legislation failed?

Firmin: We began working with INDA. We invited their representatives to our Cottage Place pump station at Westbrook. We shut off the screening compactor and collected the material. The INDA people went through everything and identified what it was. Between 17 and 24 percent of the material we pulled off our screen was baby wipes that won't disperse.

We've continued working with INDA, and one thing they're going to do is to create focus groups so we can start to understand consumer behavior: What do people know about wipes? What do they know about whether they're flushable? What do they know about how to dispose of them? The next step is to figure out what can be done from a marketing or labeling perspective to help people understand how to dispose of these materials properly.

tpo: What else have you done to help gather data and define the problem?

Firmin: Based on what we saw INDA doing at our pump station, we thought that if we could create a pump clog and sewer obstruction SOP [standard operating procedure], and if we could model it after what the INDA people did to identify the materials, but yet make it practical enough that collection system or treatment plant operators would do it, and if there were a standardized form, we could start collecting data that would help us understand the nature of pump clogs and where they were happening.

We developed the SOP, and the MWWCA introduced it at our 2012 spring conference. Now we're trying to get people to use it. The form asks them to go through and separate the material into piles: large wipes, medium wipes, small wipes, paper towels, feminine products and other.

tpo: Where can operators get access to this SOP?

Firmin: It's available on the MWWCA website at www.mwwca.org/pumpclogsop.html.

tpo: What role do you see consumer education playing in helping to address this problem?

Firmin: It's too easy to say, "Educate the consumers." Who's going to educate them? If I don't have time to unplug pumps, I certainly don't have time to call everybody and ask them not to flush wipes. At Portland Water District, our public relations staff has developed literature and, working with a local university, decals, posters, etc. The effectiveness of our PR campaign was limited, and again smaller utilities simply don't have the resources to wage this education battle.

In terms of educating consumers, one thing we see is utilities telling people the only thing they should flush is toilet paper. And yet the industry is coming out with these "flushable" wipes. There are products we've tested, where we put them in a beaker with water and a stirrer, and they do break up and they're probably truly flushable. But some products aren't flushable, yet say they are. Some products don't say anything but are sold next to a "flushable" product. If the utilities are saying don't flush the products, and the manufacturers are saying you can flush these products, consumers are going to get very confused. We all need to be on the same page.

Our position is "You need to do better non-flushable labeling to make education possible." Ideally, we'd like to see the industry make more products that really do break down in the sewer. Of course, they're probably going to be more expensive, and they're probably not going to be as strong.

tpo: How would you assess the benefits of the work done so far?

Firmin: We have benefited here in Maine by reaching out to the people in California and New Jersey. We have a stronger collaborative voice in working with the industry, which has been as responsive as you could expect them to be. Now if we can define the problem better and get some data together, and if we can share that data with legislators, other communities nationally, decision makers and the industry, we'll be able to begin a meaningful discussion of the issue, and hopefully start making some headway. **tpo**


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Others reach for it.
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1. KSB HYBRID MIXERS, SLOW-SPEED AGITATORS

Hybrid mixers and slow-speed agitators from KSB can reduce mixing energy requirements by 50 to 75 percent. The midsized mixers are designed for biogas production. Slow-speed agitators accelerate the bulk flow of the substrate throughout the reactor and generate local shear flow to release gas bubbles from fermenting liquid. The agitators can handle large flow volumes while delivering high thrust. **804/222-1818; www.ksbusa.com.**

2. CUMMINS DIESEL GENERATOR SET MODELS

Four diesel generator sets (175, 200, 275, 300 kW) from Cummins Power Generation, division of Cummins Inc., feature QSB7 and QSL9 engine platforms. All models comply with EPA Tier 3 emission requirements. Model 175 and 200 use the QSB7 engine and are smaller and lighter than the models they replace. Models 275 and 300 use the QSL9 engine and offer improved cold-weather starting and quieter performance. **763/574-5000; www.cummins.com.**

3. ABB LOW VOLTAGE MOTOR CONTROL CENTER

The MNS-MCC low-voltage motor control center from ABB Low Voltage Products is designed to address the causes of arc flash incidents. The unit meets UL 845, CSA C22.2 and IBC-2006 standards, is available in plug-in and withdrawable types with up to 4000A horizontal bus and 1600A vertical bus. The design is available in a variety of unit types, including starters, softstarters, variable-frequency drives and mains, and feeder breakers. **800/385-1221; www.abb.us/lowvoltage.**

4. FERRATE WATER, WASTEWATER TREATMENT SYSTEM

The Ferrator water and wastewater treatment system from Ferrate Treatment Technologies is designed for municipal and industrial applications. The on-site system can be skid-mounted. Models can treat from 1 to 60 mgd. Ferrate is a supercharged iron molecule, does not create disinfection byproducts and is environmentally safe. In a single application, ferrate can simultaneously perform as an oxidant and coagulant, and can replace coagulants such as ferric chloride, alum and polymers for the removal of metals, non-metals and humic acids. Ferrate has been demonstrated to treat antibiotics, hormones, pesticides and personal care products that end up in sewers and pass through municipal treatment plants. **407/857-5721; www.ferrate.biz.**

5. BEL-ART SCIENCEWARE COLONY COUNTER

The Scienceware colony counter from Bel-Art Products counts colonies of bacteria or other microorganisms on an agar plate. The pen-style device marks, counts and gives an audible and visual alert each time a count is registered on the digital display. It can store up to 35 sample counts in memory and display the sum total of all colonies counted. The display has a backlight for easy viewing in low light conditions. **800/423-5278; www.belart.com.**

6. NK TECHNOLOGIES CURRENT SENSING SWITCH

The ASXP current sensing switch from NK Technologies is available with a user-adjustable setpoint from 1-80A and designed for use with 24 VAC/DC or 120 VAC electrical sources. The switches deliver OEM-caliber accuracy, precision tolerances, low hysteresis and an operation range between 40 and 100 Hz. Suited for monitoring single- and three-phase motors, the switches feature solid-core enclosures and LED indicators for trip point contact status. **800/959-4014; www.nktechnologies.com.**

7. ORENCO TCOM TELEMETRY CONTROL PANELS

TCOM telemetry control panels from Orenco Systems are a simplified, affordable SCADA system for facility managers and operators who need to monitor/control equipment. The system requires no interface software. Features include access and control via phone line, cellular, RF or other remote devices, automatic call-out to pagers or email-capable devices during alarms, data logging with time and date stamp, industry standard Modbus device-to-device communication support and networking for multiple panels. **800/348-9843; www.orenco.com.**

8. ENDRESS+HAUSER DIFFERENTIAL PRESSURE LEVEL TRANSMITTER

The Deltabar FMD72 electronic differential pressure measurement system from Endress+Hauser uses two pressure sensor modules connected electronically to a single transmitter, eliminating the need for impulse lines or capillaries. One sensor module measures the hydrostatic (high pressure) and the second measures the head pressure. The transmitter calculates differential pressure. Measured values can be used to calculate the level, volume or mass of liquids in pressurized tanks. Sensors connect to the transmitter module via industry standard, color-coded twisted pair cable and have NEMA 4X/6P watertight housings and connections. **888/363-7377; www.us.endress.com.**

9. MOYNO CLOSE-COUPLED PUMPS

The 2000 series WA and WB model close-coupled pumps from Moyno are designed for lower pressure and lower flow applications. The WA features standard size/keyed gear reducer shaft; sealed, gear-type universal joint drive train; and optimized rotor/stator pumping element geometry. The 2000 WB features tradition close-coupled design with thrust and radial loads supported by the bearings in the gear reducer, no shaft bearings, sealed, gear-type universal joint drive train, and optimized rotor/stator pumping element geometry. **877/486-6966; www.moyno.com.**

10. PEPPERL+FUCHS POWER SUPPLY SIGNAL CONDITIONER

The KFU8-VCR-1 transmitter power supply signal conditioner from Pepperl+Fuchs features various inputs for standard voltage and current inputs. The 1-channel signal conditioners can be powered by a range of AC and DC power with the ability to drive up to 750 ohms. **330/486-0002; www.pepperl-fuchs.us.**

(continued)

product spotlight

Custom baffle system offers versatility, durability

By Ed Wodalski

Director II tank baffles from Environetics are designed for tank-based waste treatment. The baffles are custom manufactured from heavy-duty reinforced geomembranes to improve flow patterns in circular or rectangular tanks. An alternative to concrete or fiberglass baffles, the UV- and chemical-resistant panels have stainless steel frames for durability and ease of installation without field fabrication or welding.

"If treatment solutions change over the years, this is something you can move to change the configuration over time, whereas, if you put in a concrete wall, it's pretty permanent," says Rick Winters, vice president of marketing. "This is a cost-effective and versatile solution."

The mechanical perimeter batten system provides a positive seal. Applications include selector systems for biological nutrient removal, chlorine contact chambers, anoxic zones for denitrification, mixing and clarification zones, and establishing vertical or horizontal flow. Modular components can be assembled in the tank or connected outside and set by crane.

The baffles are designed to fit specific tank profiles and can be installed in about a day. "Although we have manufactured tank baffles up to 150 feet long, wastewater treatment tanks rarely are engineered to exceed 25 feet in depth," Winters says. "Typically, these tanks are rectangular with aeration on the floor, and they're using these to create separate treatment cells within the existing tank.

"It's mostly a retrofit for older systems that had just one big open tank. Now they want to create separate treatment zones within that tank to alter the process and make it more efficient. They might have an area of higher concentration of aeration and a settling zone on the other side of the baffle. Most of the time, the baffles are 20 to 30 feet wide and 15 to 20 feet deep."

Director II tank baffles from Environetics

Choices include flow-over and flow-under baffles, flow-around baffles, flow-through window baffles, complex baffle intersections, weir and clean-out ports, scum and debris ports, and pipe and penetration boots. "There's no maintenance required," Winters says. "They hold up in any type of environment. The stainless steel material lasts indefinitely. The baffle material, the curtain material, has been used in wastewater applications for 30 years." **815/838-8331; www.environeticsinc.com.**

11. CONERY 8-INCH RAIL SYSTEM

The Freeflo BERS-0800 8-inch base elbow rail system from Conery Manufacturing has an ANSI flanged discharge and pull-out (6-inch pull-out model available). Flanges can be drilled to DIN specs. Elbows feature ductile iron construction, corrosion-resistant powder coating and are compatible with most major pump brands. **419/289-1444; www.conerymfg.com.**

12. LARSON ELECTRONICS POLE-MOUNTED LED WORK LIGHT

The Magnalight.com FPM-LEDSW-30-120V telescoping pole-mounted LED work light from Larson Electronics is designed for use on man lifts and lift buckets within demanding and abusive work environments. The light produces 14,790 lumens and features a simple slip-fit adjustable pole-mounting system. It can withstand heavy vibrations and wet working conditions, while producing little heat. **800/369-6671; www.magnalight.com.**

13. ROXTEC TRANSIT MANAGER SOFTWARE 3.0

Transit manager software 3.0 from Roxtec enables electrical engineers to reduce design time and cost through autoplanning. Users can enter cables manually or import project data from external cable schedules to generate automatic packing plans and print material lists for purchase. Cable and pipe designers also can calculate the weight of transits, tag cables and make changes to transits at any time. Drawings and plans can be exported as .dxf files. Created geometrics can be imported into CAD programs. **800/520-4769; www.roxtec.com.**

14. ELAN MANHOLE COVER WITH INTEGRATED ANTENNA

The composite manhole cover with integrated antenna system from ELAN Technologies and GMI Corp. is designed to support secure, rugged, industrial communications typically found in harsh underground utility environments. Applications include AMI smart metering and distribution automation for electric utilities, sewer flow monitoring and level monitoring for real-time collection system management and control, leak detection, combined and sanitary sewer overflow monitoring. The lightweight cover meets AASHTO H-20 traffic rated requirements supporting up to 100,000 pounds. **815/463-8105; www.elantechnologies.net.**

15. AC/DC EQUIPMENT POLYCARBONATE ENCLOSURES

UL listed polycarbonate enclosures from AC/DC Equipment are designed for control panels or other indoor or outdoor electrical applications. Available in hinged or non-hinged models with clear or opaque lids, boxes feature mounting feet or mounting flanges, lockable stainless steel latches, adjustable aluminum back plates and aluminum dead front doors. The enclosures are UV resistant and carry NEMA Type 2, 3, 3R, 4, 4X, 5, 6, 6P, 12 and 13 ratings. All boxes can be custom drilled or color molded. **419/281-9120; www.acdcequipment.com.**

16. GRIFFIN QUIET-OPERATING PUMPS

The portable, diesel-powered Silent Pump Unit from Griffin Pump & Equipment is made to operate in low noise levels. Producing 70 decibels at 23 feet, applications include sewer bypass, wellpoint dewatering and open sumping. Features include easy access lockable doors for regular maintenance and added security. Other features include self-priming and secondary containment of fuel and engine fluids. **866/770-8100; www.griffinpump.com.**

17. VAL-MATIC TILTED DISC CHECK VALVE

The Tilted Disc check valve from Val-Matic Valve & Manufacturing is designed for raw water, cooling water and treated water and wastewater

applications. The valve's tapered metal seats are made of wear-resistant alloys to provide tight seating and long life for systems with high shut-off heads, surge tanks or multiple pump applications. The valve is offered in 125B, 150B and 250B AWWA classes in sizes 4 to 60 inches for pressure ranges up to 400 psi. **630/941-7600; www.valmatic.com.**

18. WATSON-MARLOW SODIUM HYPOCHLORITE PUMP

The 620 series pump for sodium hypochlorite from the Watson-Marlow Pumps Group can run dry and maintain ± 0.1 percent accuracy in hypo metering. The pump is designed to handle harsh chemicals in the water and wastewater industry, including ferric chloride, sodium bisulfate, aluminum, fluoride, carbon and lime slurries, polymers, aqueous ammonia, potassium permanganate and caustic slurries. The pump has no valves or seals to clog for minimum maintenance and reduced downtime. **800/282-8823; www.wmpg.com.**

19. NSU ANAEROBIC DIGESTERS

Anaerobic digesters from Natural Systems Utilities capture and convert organic matter to biogas for reuse. NSU offers complimentary preliminary evaluations to review the viability of privately funded biogas projects for wastewater treatment plants. The public-private partnership enables utilities to design, build, finance and operate plant upgrades. **612/616-6370; www.naturalsystemsutilities.com.**

20. HAYWARD WCV WAFER CHECK VALVES

WCV series wafer check valves from Hayward Flow Control feature all thermoplastic molded construction, including angle seat and disc design for high flow capacities. The valves fit both ANSII50 and PN10 flanges. They are available in PVC and CPVC in 2- to 8-inch diameters with a maximum pressure rating of 150 psi non-shock at 70 degrees F. **888/429-4635; www.haywardflowcontrol.com.**

21. ASSMANN POLYETHYLENE TANKS, CONTAINERS

Corrosion- and chemical-resistant tanks and containers from Assmann Corporation of America are made of virgin high-density crosslink or FDA-compliant linear polyethylene. The tanks are low-temperature impact resistant, UV stabilized and available in a range of capacities and colors. Custom rotational molding, accessory fittings and custom colors are available. **888/357-3181; www.assmann-usa.com.**

22. VANAIR AIR N ARC POWER SYSTEM

The Air N Arc 1300 power system from Vanair offers six forms of power in a single 48-inch unit, including 40 cfm rotary screw compressor, 7kW AC generator, 300-amp welder, battery booster and charger, and 10.5 gpm hydraulic pump — all driven by a single engine. Small enough to fit behind the cab or on the side pack of a vehicle, the power system provides full functionality with the truck engine off. **800/526-8817; www.vanair.com. tpo**

Pump Solutions Group launches websites

Pump Solutions Group launched its new website, www.psgdover.com. The site is part of PSG's "One Company-One Customer" brand image. The initiative demonstrates PSG's commitment to one common voice and image for all of its pump brands. The company also launched new sites for Blackmer (www.blackmer.com), Neptune (www.neptune1.com), Wilden (www.wildenpump.com), EnviroGear (www.envirogearpump.com), Griswold Pump Co. (www.griswoldpump.com) and Mouvex (www.mouvex.com), as well as a new corporate brochure.

MWH Global sells MWH Laboratories to Eurofins

MWH Global, provider of strategic consulting, environmental engineering and construction services, sold MWH Laboratories to Eurofins Scientific, a leader in analytical testing support. MWH Laboratories, one of the largest water quality laboratories in the United States, provides technical services from its 34,000-square-foot facility in Monrovia, Calif. Eurofins, a leader in food and pharmaceutical product testing, has 170 laboratories in 32 countries. It will retain MWH's management and 100 employees, renaming the facility Eurofins Eaton Analytical in honor of Dr. Andrew Eaton for his leadership in water quality and 32 years of service.

Wilo USA partners with Duke Energy, names director of sales

Wilo USA partnered with Duke Energy, an electrical utility provider for North and South Carolina, Kentucky, Ohio and Indiana, and appointed Matthew Beasley director of sales.

Orenco launches multilingual Web portal

Orenco Systems added a multilingual Web portal, translated into Portuguese and Spanish and soon to include French, to its website, www.orenco.com. The Web portal includes links to translations of key product brochures.

Vacon opens Solar Competence Center in Spain

Global AC drives manufacturer Vacon opened a Solar Competence Center in Barcelona, Spain. The center complements and supports Vacon's solar product portfolio, providing engineering, customer training, presentations and participation in project meetings for customers who purchase Vacon Solar products.

FCI analyzer receives Canadian approvals

The Model FS10A analyzer flow switch/monitor from Fluid Components International received FM and FMc Canadian approvals, making the device suitable for continuous flow verification applications that support process analyzer sampling systems operating in hazardous plant areas in the United States, Canada and elsewhere. The approvals include nonincendive Class I, Division 2 Groups A, B, C, D; Class II, Division 2 Groups E, F, G; and Class II T4@Ta=71 degrees C Type 4X.

Control Works relocates sales, engineering offices

Control Works, supplier of custom control panels, moved into its new sales and engineering offices at 400 Techne Center Drive, Suite 104, Milford, Ohio. Phone and fax numbers remain the same.

Oldham launches expanded website

Oldham, an Industrial Scientific company, launched an expanded website, www.oldhamgas.com. The site offers information on products, applications, custom system design, support and sustainability.

DSI offers webinar on benefits of eddy current drives

Drives manufacturer DSI Dynamatic will hold a webinar, "True Pump System Efficiency: The major cost advantages of electromagnetic eddy current drives," on Thursday, Nov. 29 at 3 p.m. Eastern time.

Presenters will be company representatives Anthony Anniballi and Gary Patterson. The webinar will demonstrate the technology comparisons and overall cost advantages of electromagnetic eddy current drives versus variable-frequency drives (VFDs), notably for medium-voltage water and wastewater adjustable-speed pumping and centrifugal blower applications. To register, visit www.tpomag.com/dsi.

Red Valve offers product catalog

Red Valve's 28-page condensed catalog includes the latest information on its quality pinch valves, Tideflex check valves, non-clogging air diffusers, Redflex expansion joints and other flow control products. The catalog includes product dimensions and applications.

Alfa Laval acquires Gamajet

Alfa Laval acquired Gamajet Cleaning Systems, forming a new company, Alfa Laval Tank Equipment Inc. It will operate as Gamajet Cleaning Systems and remain in Exton, Pa. Robert Delaney, president of Gamajet, was named president of the new company. Alfa Laval's existing line of tank cleaning equipment, Toftejorg, was absorbed by the new company for North America. Sales, support and service of Toftejorg equipment will be handled at Gamajet's Exton office. **tpo**

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DECEMBER

BUSINESSES

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Soil Shaker 2000. Universal skid steer attachment for drainfield restoration. Buy factory direct. $6,250. www.soilshaker.com or call 320-293-6644. (P1-12)

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EDUCATION

RoyCEU.com: We provide continuing education courses for water, wastewater and water distribution system operators. Log onto www.royceu.com and see our approved states and courses. Call 386-574-4307 for details. (oBM)

MISCELLANEOUS

UV DISINFECTION EQUIPMENT: Attention small wastewater treatment plant owners and operators. Very easy installation. Brand new product. US patent pending. callagher@sbcglobal.net, www.thefecalfighter.com. (oBM)

POSITIONS AVAILABLE

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people/awards

Washington Suburban Sanitary Commission wastewater treatments plants in Seneca, Parkway and Damascus received Platinum Peak Performance Awards from the National Association of Clean Water Agencies for 100 percent compliance with their NPDES permits for five consecutive years.

The **Red River Regional Wastewater Authority** received the 2012 Spirit of Kentucky Award at the 37th annual Governor's Local Issues Conference.

The **City of Clinton (Okla.) Wastewater Treatment Facility** won the 2012 George W. Burke Jr. Facility Safety Award from the Water Environment Federation.

The **Dublin San Ramon Services District** received the Organizational Excellence Award from the California Association of Sanitation Agencies for its efforts in organizing the Bay Area Chemical Consortium, a cooperative of wastewater and water agencies that solicits sealed bids collectively to reduce the cost of chemicals.

Bossier City received the Community Achievement Award from the Louisiana Municipal Association for its work in expanding and upgrading the city's water treatment plant.

The **Metro Wastewater Reclamation District Board of Directors** (Denver, Colo.) elected the officers to one-year terms: Margaret Medellin, chairperson; Pete Adler, chairman pro tem; Daniel Mikesell, secretary; and Philip Burgi, treasurer.

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

Georgia

The Georgia Association of Water Professionals has a Backflow Prevention Specialty Workshop on Dec. 12 in Savannah. Visit www.gawp.org.

Kansas

The Kansas Water Environment Association is offering these courses:

- Dec. 4 – An Examination of Your Ethics, Hays
- Dec. 5-6 – Advanced Electrical Maintenance and Troubleshooting, Lawrence
- Dec. 5-6 – Wastewater Concepts, Olathe
- Dec. 6 – An Examination of Your Safety, Hays
- Dec. 11 – Special Topics-Ultrasound and Ultraviolet, Garden City
- Dec. 12-13 – Wastewater District School, Emporia
- Dec. 20 – Small Wastewater Systems, Scott City
- Dec. 27 – Special Topics-Corrosion, Dodge City
- Jan. 3 – An Examination of Your Ethics, Dodge City
- Jan. 4 – An Examination of Your Safety, Dodge City
- Jan. 8 – Special Topics-Emerging Contaminants, Garden City
- Jan. 17 – Intro to Water and Wastewater Conveyance, Dodge City
- Jan. 22 – Special Topics-Ultrasound and Ultraviolet, Hays
- Jan. 24 – Special Topics-Corrosion, Garden City
- Jan. 24-25 – Wastewater Workshop, Ft. Scott
- Feb. 1 – Wastewater Preparation, Phillipsburg
- Feb. 8 – Small Wastewater Systems, Dodge City
- Feb. 13-14 – Utility Management Skills, Independence
- Feb. 14 – Wastewater Stabilization Lagoons, Liberal
- Feb. 20-21 – Wastewater Workshop, Parsons
- Feb. 26 – Special Topics-Emerging Contaminants, Dodge City
- Feb. 28 – Special Topics-Corrosion, Dodge City

Visit www.kwea.net.

CALENDAR OF EVENTS

Jan. 27-30
New England Water Environment Technical Conference and Exhibition, Boston Marriott Copley Place Hotel, Boston. Visit www.newea.org.

Feb. 4-6
New York Water Environment Association Annual Meeting and Exposition, New York Marriott Marquis. Visit www.nywea.org.

Feb. 25-28
Pumper & Cleaner Environmental Expo International, Indiana Convention Center, Indianapolis. Call 866/933-2653 or visit www.pumpershow.com.

March 10-13
American Water Works Association and Water Environment Federation Utility Management Conference, Renaissance Phoenix Glendale Hotel & Spa. Visit www.wef.org.

March 18-21
Illinois Water Environment Association and Illinois Section-AWWA Watercon 2013, Crowne Plaza Hotel, Springfield. Visit www.isawwa.org.

April 20-24
British Columbia Water and Waste Association Annual Conference and Trade Show, Kelowna, B.C. Visit www.bcwwa.org.

Nevada

The Nevada Water Environment Association has an Activated Sludge/BNR Training Course on Dec. 6 in Reno. Visit www.nvwea.org.

New York

The New York Water Environment Association is offering these courses:

- Dec. 5 – Fundamentals of Wastewater Asset Management, Hazen and Sawyer
- Dec. 12 – Sustainability, Hazen and Sawyer

Visit www.nywea.org.

Ohio

The Ohio Water Environment Association has a Biosolids Workshop on Dec. 6 in Lewis Center. Visit www.ohiowea.org.

Wisconsin

The Wisconsin Department of Natural Resources is offering these courses:

- Dec. 4 – Permit-Required Confined Space Entry, Plover
- Feb. 18-22 – General Wastewater Treatment Intro and Advanced, Chippewa Falls

Visit dnr.wi.gov.

The University of Wisconsin Department of Engineering-Professional Development is offering these courses:

- Dec. 4-6 – Sanitary Sewer and Collection System Engineering Seminar, Madison
- March 18-19 – Upgrading Your Sanitary Sewer Maintenance Program, Madison
- March 20-22 – Wastewater Pumping Systems and Lift Stations, Madison
- April 23-25 – Nutrient Removal Engineering: Phosphorus and Nitrogen in Wastewater Treatment, Madison

Visit 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.*

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