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For sanitary, storm and water system maintenance professionals February 2019

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MAPPING A BETTER FUTURE

Tennessee utility reorganizes, refocuses and embraces the challenges of system improvement

PAGE 14



Johann Coetzee Water Resources general manager Elizabethton, Tennessee

PRODUCT FOCUS: PIPELINE AND INFRASTRUCTURE, HYDRANTS







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INSIDE:

WWETT SHOW ISSUE PIPELINE AND INFRASTRUCTURE, HYDRANTS







ON THE COVER: Elizabethton (Tennessee) Water Resources General Manager Johann Coetzee and his team have focused on collecting high-quality data to map and assess both distribution and collections systems. The mapping effort is driving system improvements. (Photography by Martin Cherry)



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FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE PROFESSIONALS

Published monthly by:



1720 Maple Lake Dam Rd., PO Box 220, Three Lakes, WI 54562



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EDITORIAL CORRESPONDENCE: Send to Editor, Municipal Sewer & Water, P.O. Box 220, Three Lakes, WI, 54562 or email editor@mswmag.com.

REPRINTS AND BACK ISSUES: Visit www.mswmag.com for options and pricing. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicole.labeau@colepublishing.com. To order reprints, call Jeff Lane at 800-257-7222 (715-546-3346) or email jeff.lane@colepublishing.com.

CIRCULATION: 2018 average circulation was 37,385 copies per month (U.S. and international distribution).

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IT'S TIME FOR THE SHOW

I'm looking forward to the opportunity to see what's new and talk to you in Indy



FROM THE EDITOR Luke Laggis

ebruary is here, and the water and wastewater industry is making its annual pilgrimage to Indianapolis.

The Water & Wastewater Equipment, Treatment & Transport (WWETT) Show returns to the Indiana Convention Center Feb. 20-23. It's a great opportunity to see everything that's new in the industry, from hydroexcavators to pipe rehab systems. Just as important, it's a chance to connect with your colleagues, as well as the contractors and manufacturers who serve this industry. The learning opportunities are endless.

It might not be a full escape from winter, but the WWETT Show is a chance to get away from the day-to-day and do something that will pay dividends in the long run. Plus, you can move around a lot of downtown Indy



without ever going outside, and there are plenty of good restaurants and other establishments to keep you warm at night.

This year's show gets underway with Education Day on Wednesday, Feb. 20. The exhibit hall opens the following day and gives you three days' worth of opportunity to see and discuss all the tools that can help you do your work more efficiently.

And of course, there's no bigger gathering of your peers and no greater opportunity to compare notes and gain the perspective of other successful operators. Think of it as four fun days of training and education to make your utility stronger. You're in the field every day and have plenty of perspective on the work you do. But how often do you talk to other utility operators, contractors or equipment manufacturers to gain their perspective?

I've met a lot of people at the show who have given me a better understanding of the jobs you do every day, and what it takes to be successful in this industry. I'm always appreciative of that.

When COLE Publishing ran the show I was always busy, but my work on the floor brought me in contact with a lot of great people. Unfortunately I didn't always have as much time as I would have liked to stop and talk. Now that I don't have daily deadlines and responsibilities at the show, I have more time for the most important part of the show: talking to you and all the great people who keep pushing this industry forward.

If you see me out on the floor, feel free to introduce yourself. I'm always interested in hearing your stories. And if I don't see you, I appreciate your calls and emails as well. Your stories are what make this magazine work, and they help others do their work better.

Feel free to get in touch if you'd like to talk about your utilities and the work you're doing, or anything else.

Have fun at the show, and enjoy this month's issue. **♦**

Comments on this column or about any article in this publication may be directed to editor Luke Laggis, 800-257-7222; editor@mswmag.com.

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Maximize Fuel Efficiency

Fuel is a large operating cost for any municipality that owns heavy equipment. Working in a way that conserves fuel can end up saving a lot of money. To reduce fuel use, you have to know how and when fuel is being wasted. In this article, Alex Eden, product marketing manager for engine manufacturer Perkins, talks about some of the best ways to learn where your fuel is going and how you can maximize efficiency. **mswmag.com/featured**



SEVERE WINTER STORMS Prepare Your Utility

Now that winter has taken hold, it's a good time to review some of the actions sewer and water utilities can take to prepare for extreme cold weather events. Freezing temperatures and heavy snowfall during severe winter storms cause an assortment of potential problems for utilities, including pipe breaks, power loss, employee absences, limited access due to snowy roads or ice storm damage, source water quality issues related to road salt, flooding, frozen equipment and more. Learn how to prepare your utility for the threat of severe winter weather. mswmag.com/featured



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66 The one thing that's better than all these measures is avoiding a cave-in in the first place. Do it right the first time, so that a rescue is never necessary. **99**

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DESIGN FOR FLOODING Make Room for Water

Science shows that the world is shifting toward a more unstable climate. Severe weather events will likely become more extreme, while the intervals between them will become shorter. With rising sea levels and frequent floods, water landscapes will become part of our urban routine. Check out this online exclusive article to learn how some cities are better designed to make room for water. mswmag.com/featured



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FOCUS: SEWER/WATER

"We were losing 55 percent of our finished water. Plus, on rainy days, our 3.5 mgd wastewater plant was seeing as much as 8 mgd. We had to deal with this."

Johann Coetzee



Elizabethton Water Resources crew member Trevor Guy connects pipe to a directional boring head. Elizabethton replaces about 2,000 feet of galvanized waterlines with polyethylene pipe annually. (Photography by Martin Cherry)

MAPPING A BETTER FUTURE

Tennessee utility reorganizes, refocuses and embraces the challenges of system improvement

By Jim Force

ustainability means more than sound infrastructure in Elizabethton, Tennessee.

It also means a respectful relationship with its customers.

"No matter how hard you work," says Johann Coetzee, Water Resources general manager, "you have to get the relationship with the customer right.

"We are a monopoly," he adds. "We have regulatory powers and we are the only game in town. But we have to rethink that and look at our services in terms of sustainability. We not only need our customers' money, we need their goodwill. If we get those two things, we can fulfill our mission."

Service area

Located in the far northeastern corner of the state, Elizabethton Water Resources serves more than 28,000 people in Elizabethton and Carter County.

Its 75-square-mile service area includes three water treatment plants and 269 miles of water distribution lines. Raw water is drawn from three springs: Hampton, Valley Forge and Big Springs. The Watauga River Regional Water Authority serves as an additional source.

Eleven storage reservoirs have a total capacity of 6.9 million gallons, and water is moved to more than 11,500 water connections through a series of nine booster stations.

The department operates one wastewater treatment plant — an extended oxidation ditch facility designed for an average daily flow of 3.5 mgd. Originally constructed in 1958, the plant has seen a number of improvements and upgrades since. Treated effluent is discharged to the Watauga River, a popular fly-fishing and paddling stream.

A 70-mile long sewer system serves approximately 5,500 sewer connections and is powered by seven pumping stations.

Need to change

To the casual observer — maybe even the semi-interested ratepayer — it might have looked like Elizabethton Water Resources was doing just fine.

Water quality was good, sewers were working and the water and wastewater plants were winning awards.

"We were a typical utility," Coetzee says. "Our treatment plants were in good shape. Everybody was happy."

PROFILE: Elizabethton, Tennessee, Water Resources

FOUNDED:

The city was founded in 1799; the water system was established in the early 20th century

POPULATION SERVED: 28,000

AREA SERVED: 75 square miles

WATER:

269 miles of distribution lines, 11 storage reservoirs, nine booster stations, four water sources, three treatment plants (6.9-milliongallon storage capacity)

WASTEWATER:

70 miles of sewers, one wastewater treatment plant (3.5 mgd design average)

STAFF:

Johann Coetzee, general manager; Ed Mullins, facilities manager; Jonathan Pleasant, construction manager

AWARDS:

Kentucky-Tennessee Water Environment Association Operational Excellence Award — 2008-17 American Water Works Association Small Plant Category Award of Excellence for Valley Forge Water Treatment Plant — 2014 William Hunter Owen Award for Outstanding Wastewater Treatment Plant — 2009

ANNUAL OPERATING BUDGET: \$11.5 million

WEBSITE: www.elizabethton.org Robbie Hill operates a Ditch Witch JT20 horizontal directional drill on a waterline replacement project.

But deferred maintenance of the infrastructure loomed in the background, growing like a cancer. "Our water losses were creeping up," Coetzee says. "We were also experiencing inflow and infiltration in our sewer system." In 2012, the city manager and the council started waking up to the water loss phenomenon and asked Coetzee to investigate and find solutions.

"We were losing 55 percent of our finished water," Coetzee says. "Plus, on rainy days, our 3.5 mgd wastewater plant was seeing as much as 8 mgd. We had to deal with this."

Coetzee and his team developed a plan that involved not only leak testing, but full-scale replacement of miles and miles of galvanized water pipe that made up most of the distribution network. Also, cracked and broken sewers were scheduled for repair or replacement. The department planned upgrades of its storage tanks as well.

Mapping, please

It wasn't easy.

Coetzee says one of the biggest hurdles was the lack of modern GIS mapping. "In order to repair, replace and upgrade our water and sewer lines, tanks, and pump stations, we needed to practice sound asset management, and you can't do that if you don't know what you have."

Coetzee says the department's old GIS system was machine-to-machine. "We'd put things on

flash drives and hand-carry them from one place to another."

The department developed a new data system and had it reviewed by an outside engineering consultant. New GIS servers (Esri ArcMap) were installed at City Hall and connected via fiber optics to the engineering department and the city garage. In early November, all crew chiefs and water technicians started carrying iPads using Esri's Collector application. Coetzee expects his team to be able to issue electronic job tickets down the road.

"You need high-quality data and you have to be able to communicate with other software in order to know where to spend your next dollars. It's a lot better than having a pickup-truck load full of paper reports."

Addressing losses

Elizabethton's leaky water and sewer pipes are the focal point of the upgrade. While Coetzee says finished water losses are still in the 55 percent range, his team is making progress, slowly but surely.

"We have over 500,000 feet of old 2-inch galvanized waterline throughout the service area, especially out in the county," Coetzee says. "We've purchased a Ditch Witch JT20 horizontal directional drill and have three repair crews and one line laying crew, each headed by a crew leader who reports to our construction supervisor. The cost of HDD line installation is one-third that of opencut."

The line laying crew operates the HDD equipment and handles new opencut line installations. The leak repair crews do service work, repair leaks and tackle other projects like tying over customers to newly constructed lines.

The department is using Case CX60C, Bobcat E45 and Bobcat E80 mini-excavators to dig in confined areas and narrow roadways. Also, crews save time by carrying all the necessary equipment and repair components on larger service trucks so they don't have to run back and forth to the department's supply depot.

Coetzee says the department uses soundsensing devices to look for leaks and has reduced them significantly, but it is committed to replacing the galvanized lines altogether.

"It doesn't make sense to just keep fixing leaks," he says. Instead, crews are laying new 2-inch HDPE pipe on one side of the road or street, with new PEX lines tying into the customer's service connection. The department has purchased its *(continued)*



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"You need high-quality data and you have to be able to communicate with other software in order to know where to spend your next dollars."

Johann Coetzee

Construction Manager Jonathan Pleasant works with the Arc GIS system to locate a water meter. own McElroy Pit Bull 14 fusion machine to join pipe sections. The department will strategically install 6-inch lines to assure adequate fire protection in the neighborhoods.

Looking ahead, crews are also installing valves so that the new lines can be shut off in case leaks need to be repaired 20 to 25 years from now.

Coetzee says one of the issues is disconnecting the old pipe, end to end. "We don't have maps of the old lines," he explains. "If a customer had flow or pressure issues, they may have charged a line from an old line but didn't map it." He says some of the pipes were installed nearly 100 years ago, and in some cases, there may be as many as three different waterlines running beneath the same road.

That means finding the source of flowing water often requires crews to dig. "We're sometimes like gophers, digging potholes all over the place," Coetzee says. "It's important to find where an existing line is being charged from, and we've sometimes had to cut off a whole neighborhood trying to find the last 6-inch connection on an old galvanized line."

In another case, Coetzee says it took the field crew six weeks to find the connection and get the old line completely tied off.

"It's very important that we do this right."

Neighborly approach

With such a large area to upgrade, Elizabethton made another strategic decision and is replacing the pipes one neighborhood at a time. "This is an overwhelming process," Coetzee explains. "We decided to do whole neighborhoods rather than jumping around the system (responding to breaks). We've already completed all of the lines in our Eastside neighborhood with about 700 meters, as well as in the Golf Course Acres neighborhood and the Valley Forge and Cripple Creek communities. We are moving into the western part of the county next.

"Our goal is to replace 5.5 miles of galvanized a year. With 500,000 feet of line to deal with, it will take us a long time," he says, but he notes that active leaks on the repair list have dropped from 300 to 20 or even 10. The number of customer repair calls has also come down.

"Overall, we're still at 55 percent water loss. That's unacceptable, but we expect that will start coming down soon."

Sewers assessment

Elizabethton is also addressing its I&I problems, though it's taken a period of time to build up the necessary equipment. Coetzee says the department has added a new Vactor 2100 jet/vac truck and a new CUES OZIII CCTV camera on an Ultra Shorty track body. The CCTV camera system uses a K2 Dolly system (CUES) for the *(continued)*



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ONE IS MORE THAN TWO

In mathematics, the number two is greater than one.

But at the Elizabethton, Tennessee, one water resources department is proving to be better than two separate water and wastewater divisions.

"We had two different departments," says Johann Coetzee, Water Resources general manager. "Both were operating within our water-sewer enterprise fund. When we looked at the departments, they both had identical goals and missions."

Under Coetzee's leadership, Elizabethton decided to merge the two departments into one, titled Water Resources.

Coetzee calls this a "holistic" approach that not only recognized the concept of "one water," but also provided the town with numerous opportunities to save costs, as well as coordinate infrastructure repairs and maintenance.

"When we looked at it, we were taking water from our springs, preparing it for our customers at our water plants and delivering it," he says. "Then our customers used the water, we collected it and routed it to our wastewater plant where it was treated and released back to the environment.

"It is a holistic transaction that needed to be managed as a single entity."

Coetzee says Elizabethton looked at its neighbors and other utilities for ideas and possible organizational structure, then formed a hybrid department designed to fit the community's needs. The basic organization features a facilities team that works under a facilities manager to take care of the water and wastewater treatment plants and other capital assets, and a construction group that handles all maintenance, repairs and replacement work, headed by a construction manager.

"It's working really well," Coetzee says. "We're finding many synergies such as purchasing things like chemicals, and using common equipment, that cross the board.

"The biggest benefit has been on the construction side," he notes. "We've cross-trained our employees and now manage all our waterline and sewer construction as a single enterprise."



reel, which is housed in a separate trailer. The department also uses a set of InfoSense Sewer Line Rapid Assessment Tools (SL-RATs) and GraniteNet software (CUES) for its sewer camera inspection records.

Similar to the waterline work, crews are using a "no-dig" approach where possible — sliplining sections in need of replacement with new HDPE pipe and short section repairs using inserted CIP liners, avoiding the excavations and disruption associated with opencut methods.

Coetzee says with such a far-flung sewer system, the SL-RATS are helping by quickly identifying the location of obstructions. "The sonic device, inserted into manholes, tells us where we may have an issue. Then we can go in and televise that section." It's much more focused than trying to televise the entire 70-mile system, he says.

"The SL-RATs tell us where we need to spend more time on CCTV investigation. The CCTV investigation tells us whether we need point repairs, sliplining or replacement."

Figuring out how to accelerate the sewer line repair effort is a major challenge, Coetzee says. "With the sewer lines now on our GIS platform, we are generating job tickets faster than we can deal with them."

Tank upgrades

The upgrade program is also remediating the department's 11 storage tanks. Coetzee says his crews are repairing and repainting one tank at a time, focusing first on the ones in most need. "Our protocol has been one tank per year, but now we're going to do one tank every other year," he explains. "It's moving along fine."

Coetzee says so far the bidding and contract supervision has been done in-house with the assistance of Carver Engineering, but long-term maintenance agreements may be used in the future. "We wanted to establish a baseline cost first; in other words, establish a cost profile before we invited bids for long-term maintenance agreements. Until we have that cost profile, we don't know how to respond (to long-term tank maintenance offerings)."

True costs

After discussing his department's comprehensive upgrade program, Coetzee pauses to



reflect on costs, lessons learned and customer relationships.

"The first hurdle most communities face is they are forgetful of the full cost of their infrastructure," he says. "It's not just the cost to operate the system; our infrastructure has a limited life span, it will need replacement.

"If something's broken, you can just throw money at it and go out and fix it," he says. "But that's not always sustainable."

Utilities need to be mindful of the full cost

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Vactor Manufacturing 800-627-3171 www.vactor.com (See ad page 3) of the services they provide, he says, warning against basing revenue projections on usage because water use may drop as appliances become more efficient.

That's why that customer relationship is so important.

"In our case, we proposed raising rates over a five-year period," Coetzee says. "The community was not too happy with us, so we went back after a year and made adjustments.

"We needed to come up with a 12- to 15-year investment profile which would get us caught up on our deferred maintenance. And we made sure everyone understood. We put information on our

"Our goal is to replace 5.5 miles of galvanized a year. With 500,000 feet of line to deal with, it will take us a long time."

Johann Coetzee

website. We talked to folks.

"The public wants three things from us," he says. "They want sound management of our systems, accountability with their money and a positive relationship that is respectful and helpful on all sides." ✦



CUTTING THROUGH THE PROBLEM

Wipes Ready technology brings a new approach to wastewater grinders and helps utilities deal with a persistent and growing problem

By Ted J. Rulseh



TECH CLOSE UP

PRODUCT: Muffin Monster and Channel Monster grinders

MANUFACTURER: JWC Environmental 800-331-2277 www.jwce.com

APPLICATION:

Technology to help utilities deal with wipes effectively

BENEFITS:

Produces a controlled particle that does not reweave into pump-clogging rag balls

o one in wastewater collections needs to be told that wipes are a problem. Utilities try to educate residents to keep wipes out of their toilets. Wipes manufacturers are working to make their products more flushable.

In the meantime, though, wipes continue to get into collections and treatment systems, where they can clog pumps and cause expensive maintenance problems. That calls for mechanical solutions, most notably sewage grinders.

JWC Environmental, a longtime grinder manufacturer, has developed a technology to help utilities deal with wipes effectively. The company's Wipes Ready technology, available for its Muffin Monster and Channel Monster grinders, received a 2017 Innovative Technology Award from the Water Environment Federation.

Available in new grinders and for retrofits in the field, the technology was recognized for its 17-tooth cutter with serrated edges, a design that cuts wipes and other material in two dimensions, producing a controlled particle that does not reweave into pump-clogging rag balls. The design also includes features to maximize the capture of wipes and feed the material into the grinder.

Rob Sabol, director of research and development, and Kevin Bates, director of marketing and product management, talked about the technology in an interview with *Municipal Sewer & Water*.

MSW: What was the driving force behind the development of this technology?

Sabol: The aim was to reduce the inorganic solids in wastewater and protect pumps and downstream equipment. Many wipes by design are very resilient, and they are tough to grind. Customers told us they were having problems with these wipes getting into pumps and causing shutdowns. *(continued)*

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The cutter reduces wipes and other inorganic solids to small particles.

The material had evolved beyond the capability of existing technology; we had to do something different to break those wipes down.

MSW: How would you describe your approach to the problem?

Sabol: First, we looked at the nature of the cloth and did a lot of research and testing of the different kinds of wipes — how they were designed, how they were held together and how to break them down. We quickly learned that not all wipes are created equal. One thing we found was that if you cut the wipes into strips, the resulting material would twine itself with hair, grease and other debris in the waste stream and form rag balls. We saw a need to break wipes down into a geometry that's less susceptible to rag ball formation.

MSW: What kind of geometry is that?

Sabol: We wanted to create pieces small enough not to twine with other materials but also large enough not to pass through screens at the treatment plant headworks. Our goal was a confetti cut: particles about a 1/2- to 3/4-inch square.

MSW: How is that accomplished in the cutting mechanism?

Sabol: Two-shafted grinders are very good at cutting in one dimension, in strips. We had to find a way to cut in two dimensions. The breakthrough was the serrations on the cutters. If you look at a roll of Scotch tape, you drag the tape across a serrated blade. The serrations weaken the material so that it breaks when stretched or pulled. So, the Wipes Ready cutters have serrated teeth that perforate the wipes. And then the differential speeds of the two shafts create a tearing action. That breaks "Customers told us they were having problems with these wipes getting into pumps and causing shutdowns. The material had evolved beyond the capability of existing technology; we had to do something different to break those wipes down."

Rob Sabol

the material into roughly square pieces.

MSW: How does the technology enable the optimum capture of wipes for cutting?

Sabol: We took a two-pronged approach. While developing the Wipes Ready cutter, we looked at how we could enhance the side rail to not only allow water to pass through, but also promote

material entry to the cutter. On the Muffin Monster, we have Delta-P side rails with a delta shape, creating a pressure gradient that directs the water flow toward the cutter, so we can get very high volumes of water to pass through and still get great capture efficiency. On the Channel Monster, we can increase the flow even more by replacing the Delta-P side rails with a rotating perforated drum filter. The 1/2-inch hole spacing we use is key to capturing solids and delivering them to the grinder for breakdown while also preventing the stapling of hair and other materials on the outside of the drum and preventing the buildup of grease.

MSW: Does this technology include any other design innovations?

Sabol: Yes. Optimum Cut Control gearing works with the Wipes Ready cutter. Through testing, we determined the gear ratios in the two counterrotating shafts that create the tearing action to achieve the optimum particle size reduction. We also optimized the clean-out of the cutting chamber to enable processing of material through the system as quickly as possible.

MSW: What are the relative shares of new Wipes Ready installations versus retrofits?

Bates: We're seeing interest equally across customers who already have our equipment and those who need a new grinder in the collections system. As sewage has changed, existing customers have been able to upgrade their systems. Wipes have been growing at 5 to 6 percent a year since 2000, so people who never had problems before are starting to have problems.

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the technology.

on the industry?

ings because they no longer have rags in their pumps reducing

efficiency. Early adopters like this agency really helped prove out

Sabol: It's a terrible job to unclog a sewage pump. Nobody wants to do it, and the safety aspects of it for the workers are significant. JWC Environmental didn't ignore the problem. We didn't go out and try to

solve it in a closet. We partnered with people. We talked to customers about their needs and developed a product that deals with the problem successfully. Making that kind of impact on the industry from the

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company's and my own perspective is really satisfying.

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Signs like the ones used at all of the Stormwater Resource area sites are on display and in use at the Merrillville Stormwater Resource Center in Merrillville, Indiana. (Photography by Marc Lebryk)

SETTING AN EXAMPLE

Innovative municipal ordinance requiring green infrastructure is setting a new standard in Indiana

By Jared Raney

f a McDonald's-size restaurant wanted to build a new location in Merrillville, Indiana, it would first need to pass a variety of creative stormwater permit requirements.

That's because Merrillville doesn't just have progressive stormwater management, it rewrote the playbook.

Amid ever-increasing national focus on stormwater management, Merrillville described by Matt Lake, executive director of the Merrillville Stormwater Utility, as a "middle-class" municipality — has taken a bold stance by requiring low-impact methods and green infrastructure for new developments through a town stormwater ordinance.

This wasn't a self-serving endeavor, though. From the beginning, Merrillville designed its program to be a standard that any other municipality across the nation could model for its own stormwater management.

"The intent of this particular effort is so that other communities can adapt and look at what we're doing and implement these requirements for their own utilities," Lake says. "Part of the concept here is to serve as an example of how to successfully incorporate green infrastructure, low-impact development, which includes recycled materials as part of your stormwater infrastructure."

Rewriting the playbook

Stormwater permits are required for any new development with an acre or more of

land disturbance, and Merrillville's new ordinance requires low-impact development for every stormwater permit that is approved.

For reference, in its franchise FAQ webpage, McDonald's puts an ideal site at around 50,000 square feet — just over 1 acre. That means any new business of a McDonald's proportion or larger would require a stormwater permit.

"It's not something that we incentivize it is required," Lake says. "Requiring lowimpact development is a progressive approach. Some communities will offer incentives for green practices. As part of our ordinance, you will not receive a stormwater permit unless everything is reviewed and approved by our department."

As part of the approval process, Merrillville has a four-page checklist that includes various green infrastructure options and low-impact-development best management practices, each worth a certain number of points. Approval requires at least 100 lowimpact-development points per acre of development with at least three different BMPs.

"If another community wants to adopt the same requirements and scale it up, they can. They could pass an ordinance that requires 200 points for every acre of development or 300," Lake says. "We felt that 100 was a very modest way to incorporate these low-impact-development practices. We didn't want to hinder economic development we wanted to promote and enhance it."

The low-impact-development options (continued)

"The Standard of the Industry"



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"The intent of this particular effort is so that other communities can adapt and look at what we're doing and implement these requirements for their own utilities."

Matt Lake

A cutaway showing how PaveDrain works at the Merrillville Stormwater Resource Center,

include features like rain gardens, pervious hardscapes, vegetative buffer zones, infiltration basins, aesthetically pleasing landscaping and hydrocarbon filters.

"The biggest pollutant by volume during construction is going to be sediment," Lake says. "We ensure temporary erosion and sediment control BMPs are installed and maintained to minimize pollutants from migrating into the catch basins or offsite in any way which could negatively impact the receiving waters. After construction is completed, the low-impact-development BMPs will help capture the 'first flush' pollutants from the site during the post-construction phase. Many of these post-construction BMPs incorporate infiltration strategies and vegetation, which utilize phytoremediation to metabolize and degrade organic pollutants or toxic heavy metals."

"We ensure that all BMPs are installed and performing properly by those responsible," Lake says. "These practices have to be inspected and enforced through our stormwater ordinance."

Becoming a green leader

With a population of approximately 35,000 on the outskirts of Chicago, Merrillville is within the Lake Michigan watershed, so preventing pollution in the midsize suburbia is also protecting one of the world's largest sources of freshwater.

"We're trying to mimic predevelopment hydrology as much as possible," Lake says. "The more stormwater infiltration you have on the site, the less runoff you have, which will minimize downstream impacts and assist with compliance of the EPA's Clean Water Act."

The town has a 20-year stormwater master plan that identifies \$25 million in infrastructure improvements for flood control and to improve stormwater quality. Beyond the new stormwater ordinance and permit requirements on private developments, the stormwater utility has also made a big change when it comes to internal projects, incorporating recycled pipe as a standard bid requirement.

Despite being a young town only established in 1971, it has older infrastructure with predominantly corrugated metal pipe that was installed as many neighborhoods were developed before incorporation.

"The older corrugated metal pipes are rotting away," Lake says. "Now we're using more sustainable materials like double-walled corrugated high-density polyethylene that's 40 percent recycled material and has a 100-year service life."

Continuous upgrades are ongoing as the utility works to replace and maintain over 800,000 feet of separated storm sewer on an as-needed basis, and the town has committed to using recycled pipe as applicable when those upgrades are needed.

Recognition well-deserved

It's not just the common detention ponds, bioswales and rain gardens on the stormwater permit checklist. One innovative alternative that Merrillville has included is an option for developers to use the same recycled HDPE pipe for its

PROFILE: Merrillville, Indiana, Stormwater Management

ESTABLISHED:

POPULATION: 34,871

STORMWATER SYSTEM: 800,000 feet of underground storm drain conveyance

AWARDS:

Indiana Governor's Award for Environmental Excellence in Reuse and Recycling — 2018 Indiana Governor's Award for Environmental Excellence in Greening the Government — 2014 Indiana Association for Floodplain and Stormwater Management's Outstanding Stormwater Project — 2014 Indiana Association for Floodplain and Stormwater Management's Excellence in Stormwater Management — 2012

projects to meet the low-impact-development requirements.

The effort to include recycled pipe in its stormwater infrastructure earned the utility its second state-level environmental award, the Indiana Governor's Award for Environmental Excellence in Reuse and Recycling. Previously, Merrillville won a similar Greening the Government award for creating the largest rain garden in the state as part of a green streets project.

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RECYCLING AS A STANDARD

When it comes to stormwater pipe that has at least 40 percent recycled HDPE, Merrillville (Indiana) has used Prinsco ECOFLO100 and Advanced Drainage Systems MEGA GREEN pipe. Those are the products that meet Merrillville's and the American Association of State Highway and Transportation Officials' performance standards for HDPE pipe.

ECOFLO100 was used in the town's pilot project, the success of which spurred its decision to require recycled pipe meeting the same standards.

According to Matt Lake, executive director of the Merrillville Stormwater Utility, companies like Advanced Drainage Systems recycle over 400 million pounds of plastic annually to produce the 40 percent recycled HDPE pipe products.

For every 240 pounds of plastic — or in other words, a 20-foot length of 48-inch pipe — using 40 percent recycled can save 82 gallons of oil and 3.6 cubic yards of landfill space.

"Everything else about the recycled pipe is the same: the look, the dimensions, the performance," Lake says. "It's an easy transition and something any community can look at and say, 'Well, we can do the same thing." Green infrastructure and low-impact development doesn't end with the permitting process. One of the keys to success is making sure the infrastructure is properly maintained.

"We've received awards and a lot of recognition. But it's not about the awards," Lake says. "To me, the awards and the recognition are ways to promote these types of practices. If someone reads this and says, 'We can probably do that for our town or our city,' then that's really what we want in order to minimize pollutants within our watersheds. We're going to keep doing what we do, but we also want to encourage other communities to implement low-impact development to protect our lakes, rivers and streams."

A never-ending effort

Green infrastructure and low-impact development doesn't end with the permitting process. It's a consistent effort, promoting new ideas and methods, adding to available BMPs, and most important, making sure the green infrastructure already in place is properly maintained.

"The follow-up is important, in terms

"The more stormwater infiltration you have on the site, the less runoff you have, which will minimize downstream impacts and assist with compliance of the EPA's Clean Water Act."

Matt Lake

of inspecting areas, and making sure they're maintained by the owner. That's a vital component and oftentimes missed when you have plant-based green infrastructure such as rain gardens. If they're not properly managed, then they look like weed patches — they don't look like intentional landscaping," Lake says. "That gives a negative stigma to green infrastructure. That's an important aspect once you actually incorporate these requirements."

To that end, having the support and commitment of community leaders is (continued)

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Merrillville Stormwater Utility secretary Liz Bushemi, Executive Director Matt Lake and compliance officer Joe Fish at the Resource Center in Merrillville, Indiana.

important. It was the progressive mindset of the Merrillville Town Council that inspired Lake to jump ship from a career in consulting.

"We had some key members here who said,

"We want to do things a little bit differently," Lake says. "We want to manage things differently. We want to be the example of what a stormwater utility is, how it's managed, and what kind "We want to manage things differently. We want to be the example of what a stormwater utility is, how it's managed, and what kind of projects they do, and to establish something that's unique."

Matt Lake

of projects they do, and to establish something that's unique."

"There's a strategic, multifaceted approach to incorporating low-impact development and green infrastructure," he says. "The proper development of any community is vital, and you want to implement what we consider a smart growth approach. Everything has to be designed and planned properly in order to expand and enhance areas for new development as well as redevelopment to minimize our impact to the environment." \blacklozenge

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MANAGERS MATTER

Good managers are critical to any organization's success, and it's important to learn how to develop them in-house

By Ken Wysocky

L's said that when employees quit jobs, they more often leave because of bad managers rather than the company itself. And if that's the case, developing great managers should be of prime importance to organizations, given their ability to minimize employee turnover and improve employee engagement.

That may seem obvious, but developing good managers still appears to be a mystery to many organizations, judging from the high level of disengagement among American workers reported in Gallup Polls and other studies.

Things could be much different if companies took a more thoughtful approach to promoting and training managers, says Kim Dawson, director of employee experience at YouEarnedIt, a company that helps organizations improve retention and engage-

"Managers are no different than any other employee. They need leadership and guidance to be successful."

Kim Dawson

ment through peer-to-peer recognition platforms. Moreover, the blueprint for developing good managers isn't all that complicated either, notes Dawson, who has more than 15 years' experience in human resources.

"Managers are no different than any other employee," she

says. "They need leadership and guidance to be successful."

It's difficult to understate the importance of good managers. They're the first and primary connection points for employees, so how much managers help them be successful on a daily basis truly makes or breaks their experience with the company, she explains.

"A good manager will remove impediments to employees' success, set goals and follow up on progress toward those goals," Dawson says. "Employees need to know what success looks like in their roles and how that affects the company overall. When employees can find purpose in their everyday work, they're not only more engaged, they're more fulfilled at work."

Shatter management myths

So how do organizations go about developing good managers?

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-today people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800-257-7222, or email editor@mswmag.com.

They can start by avoiding some of the management myths that pervade the business world. A good example is the penchant for promoting high-performing employees to managerial positions, she suggests.

"Research from Gallup shows that's a bad strategy that can hurt engagement and business results," she says. "Not all employees are cut out to be business managers. One of the biggest problems is that organizations don't necessarily dig into what employees really want to do. They assume that because an employee is a highperformer, they automatically want to become a manager. In reality, lots of high performers want to stay on a professional track and not even manage people."

To avoid this, organizations need to create clear career paths, including some that offer promotions or rewards for people who don't want to become managers. In the absence of such transparency, many employees who aren't interested in being a manager may still say yes to promotions because they feel like it's the only way they can be rewarded for their good work, Dawson says.

"Generally speaking, they think it (accepting an unwanted managerial promotion) is the only way to get a leg up — earn more money and be more successful," she says. "But instead, it does a disservice to both them and the company."

Skills can be taught

Another myth posits that leadership qualities can't be learned; either people have them or they don't. But while it's true that some people inherently possess qualities that make them good managers, those qualities also can be taught and learned, Dawson says.

As such, organizations should first decide exactly what qualities define a successful manager, then develop a job description that incorporates those expectations. After that, organizations must assess how managers stack up against that criteria. "Then companies can identify what they need to work on and provide training to fill the gaps," she notes. "When you promote without giving people the tools to be successful, it negatively impacts their direct reports — and the business. "Sadly, there's no magic bullet for developing good managers," she continues. "It takes time and planning. You have to determine what sets of soft and hard skills managers need to be successful."

Regular one-on-one meetings with employees definitely should be part of those job expectations. Training is available so that new managers can learn how to conduct an effective one-on-one meeting, Dawson says.

"One-on-one meetings help managers build relationships with employees," she says. "It shouldn't be a difficult ask for managers to get this kind of training so they can connect better with employees."

Meetings and readings

Dawson also strongly advocates holding managers' meetings, without senior management present. That way, managers can get better by speaking candidly and leveraging each other's experience and managerial strengths.

"At YouEarnedIt, we meet once a month for an hour and discuss a different topic each time, such as empathetic and active listening," she says. "We also make time to talk about issues and challenges we're facing. I've seen this work effectively at every place I've worked."

Book clubs offer another effective strategy. Reading books about what it takes to be a good manager, then discussing the material with others is a great way to cultivate more effective managerial techniques, she says. (As an example, Dawson cites a book called *Radical Candor: Be a Kick-Ass Boss Without Losing Your Humanity*, written by Kim Scott.)

"It's an easy, low-cost form of training," Dawson points out. "You don't have to make a big investment in time and money."

In addition, many organizations would be well-served by taking a close look at where employee turnover is the lowest and highest. High attrition in a department or division could very well stem from a bad manager in need of training. Low turnover, on the other hand, could likely be the result of an effective manager.

"Organizations then should figure out what he or she is doing that's so effective, then get training in those areas for other managers," Dawson says.

Value outside perspectives

Mentorship can also play a key role. If a good manager leaves a company, Dawson encourages his or her direct reports to stay in touch.

"Mentorship cannot be overvalued," she says. "Also, if you have a manager who's not as successful as you'd like, find a mentor for them outside the company. That offers a ton of value because many times people become boxed in where they work and see only their own perspectives. Outside perspectives broaden their horizons."

The bottom line: With dramatically low unemployment creating a shrinking labor pool, having good managers is more important than ever to attracting and retaining employees in a highly competitive environment.

"So if you're getting bad Glassdoor reviews or have high attrition, you need to take a close look at your managers and train them so you can keep attracting new talent," Dawson concludes. "You can't overdramatize the importance of this."



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BREAKING A DESTRUCTIVE CYCLE

Corrosion-resistant manhole rehab system solves a significant problem with Laredo's aging infrastructure

By Angus W. Stocking



After years of semi-successful manhole rehabilitation, the city of Laredo, Texas, turned to the Permacast system from AP/M Permaform for a more permanent solution.

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MANUFACTURER: AP/M Permaform 800-662-6465 www.permaform.net

APPLICATION: Coating concrete with epoxy

to protect from sewer failure

BENEFITS:

Prevents concrete from deteriorating to sulfuric acid

USER: City of Laredo, Texas

hen one of the state's oldest cities is also its fastest growing, there are bound to be infrastructure issues.

Such is the case in Laredo, Texas, a city of 250,000 that was founded way back in 1755. Growth has put significant stress on the city's aging — and in places antique — sewer infrastructure.

"We have 700 miles of pipe in our sanitary sewer network, half clay and half PVC," says Angel Leon, Laredo Wastewater Collection superintendent. "PVC and some new clay was installed in the '80s and '90s, but much of the clay in the downtown area is over a hundred years old."

Leon has held his position for 10 years, and during that time manhole maintenance and rehabilitation have been a particular focus, for several reasons. For one, he's responsible for 12,000 manholes — 70 percent are concrete and brick, while the rest are fiberglass — and many of them are

"We keep inspecting them, and they continue to hold up with no problems at all."

Angel Leon

Texas. "Texas is mostly flat and

as old as the rest of the sys-

tem. And probably more important, mortar and con-

crete are special problems

in Laredo ... and in most of

usually warm, up to 105 degrees F most summer days," Leon explains. "And that means we, and the rest of the state, have some of the highest levels of H_0S in the nation."

Hydrogen sulfide is a well-known problem in sewers. It is toxic and corrosive, it can be explosive and flammable, and it's a definite threat to sewer pipe integrity and to maintenance workers who have to enter sewers.

Hydrogen sulfide is a colorless gas, smelling of rotten eggs, that forms in swamps and other places where organic matter rots in warm, turbulent water with low oxygen levels. Sanitary sewers obviously present good conditions for hydrogen sulfide formation, and the conditions in Laredo are about perfect. The water is warm year-round. Nearly flat sewer networks keep pipes wet and slightly turbulent, and all sewers tend to be low on oxygen. Hydrogen sulfide is bad in itself, but it's even worse as a food source for colonies of *Thiobacillus* bacteria, which thrive on the gas. The colonies, which can be huge, consume the gas and excrete sulfuric acid (technically, H_2SO_4). Some strains of *Thiobacillus* can thrive in acid concentrations as high as 7 percent. And in a matter of months, sulfuric acid can absolutely murder mortar and concrete, turning them into crumbly calcium sulfate, or gypsum, which is more like drywall than concrete. The process is called microbiologically-induced corrosion, or MIC. In Laredo, that meant catastrophic manhole failures used to be almost routine. "After one hurricane, we had five fail in a single day," Leon says.

For many years, to both prevent and rehabilitate failed sewers, Laredo employed a two-part process. After cleaning and dewatering, manholes would first be rehabilitated structurally with spraycasted concrete that was then troweled smooth by workers entering the manhole. Then, two days later after curing, the new concrete was coated with epoxy to protect against sulfuric acid secreted by the Thiobacillus bacteria. This process is effective, but it presents some risk. The spraycasting and troweling required confined-space entry, which requires trained workers and certification, not to mention the inherent danger to workers. And epoxy also requires confinedspace entry to apply and to inspect closely, and it is only effective if it is applied perfectly; even a small gap in coverage — a pinhole is enough — can be exploited by Thiobacillus, which will form invisible colonies behind the epoxy.

Laredo initially used contractors, but Leon eventually formed a crew focused mainly on manhole rehabilitation and other sewer repair projects. "To do epoxy

well, you kind of have to love it," he explains. "Contractors would usually apply it well, but not always, and we would sometimes see failures within six months. We had better success doing it ourselves, but even we had to go back sometimes."

That's where the situation stood until 2016 when Leon discovered, and decided to try, the Permacast process. Permacast is an established and proven technology from AP/M Permaform that lowers a precisely controlled bidirectional spincaster into manholes to apply thin layers of high-strength fine-aggregate composite concrete, or FACC, to manhole interiors. In Laredo, the new concrete is mixed on site and includes an MIC-resistant admixture called ConShield.

One less step, and a third less labor

"I met with the Permacast guys at a trade show, and they came down to Laredo to show me the system," Leon says. "I asked for references and was able to talk to big contractors who use the process and really like it."

A one-step process that provided both structural repair and permanent corrosion resistance was certainly appealing, and in 2016 Leon decided to take the plunge. "We already had the cement pump we needed, and the crew, so it just made sense to try this out," he says.





Permacast's structural properties are a result of the process' patented spincaster and on MS-10,000, the fine aggregate composite concrete that relies on precisely graded quartz sands, nonmetallic fibers and other complex admixtures to achieve a unique blend of strength and other desirable properties.

The structural aspects of the Permacast manhole

rehabilitation depend on the process' patented spincaster and on MS-10,000, the FACC that relies on precisely graded quartz sands, nonmetallic fibers and other complex admixtures to achieve a unique blend of strength and other desirable properties that make it a uniquely excellent choice for manhole rehabilitation.

Norman "Ed" Kampbell, P.E., president of Rehabilitation Resources Solutions and a consultant to the underground construction sector, says, "The engineering sophistication of these FACCs should not be taken lightly by the design engineering community. And it's not just the strength characteristics, which dramatically exceed those of most concrete products. Low permeability, good freeze/thaw characteristics, the right thixotropy and thin shell toughness — AP/M Permaform has really got all these right with these products, making them a great choice for sewer structures."

Thin shell toughness is important; it means that Laredo's rehab crew can apply a very thin layer of MS-10,000 — from 1/2 to 1 inch — in just three or four passes with the Permacast spincaster. The winch-supported spincaster head is lowered into and withdrawn from manholes at precise speeds that keep layers even, and the bidirectional application guarantees that the coverage isn't compromised by gaps or "shadows" due to projections or depressions in the original manhole. This is especially helpful in brick manholes.



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ConShield, a highly charged cationic polymer that makes cured concrete deadly to bacteria's cell structure, is mixed directly into the concrete. Because it becomes an integral part of the concrete matrix, it provides permanent corrosion resistance that doesn't wash or chip off and, for the same reason, it's nontoxic to humans and animals. *Thiobacillus* colonies don't form, and this prevents the production of sulfuric acid.

Laredo first used Permacast to repair 10 manholes, which have now been in service for over two years. "We keep inspecting them, and they continue to hold up with no problems at all," Leon says. His department now rehabilitates about 100 manholes annually with the process, and he'd like to expand to 200 if possible.

The workflow is very efficient compared to the former two-step process. "We power-wash the manholes, then immediately apply the MS-10,000 with the spincaster," says Raymond Martinez, assistant superintendent. "That only takes three hours, and since cure times are now just six to eight hours, the manhole is back in service quickly. We can do three a day if we want to."

Notably, confined-space entry has been nearly eliminated, making this chore much safer for the maintenance crew. Laredo's own crew, using the Permacast process, now does nearly all manhole repairs. "Once in a great while, if a manhole is in really bad shape, we'll still call on contractors," Leon says. "But frankly, it's been a year since that happened, and we may not need them again." Laredo schedules manhole work with its GIS and seems to be getting on top of the problem, with no recent manhole failures, and good performance from all Permacast repairs to date.

Cost-savings are significant. "Time and costs are about one-third what they used to be, allowing us to do a lot more of this work annually," Leon says. "And we know the manholes are doing well thanks to camera inspections — I try to check on them with TV every six months or so, and we've seen no problems. They save us a lot of money and are more efficient." \blacklozenge



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ADVANCING STANDARDS

NASSCO's updated Manual of Practice now available online By Sheila Joy

ate last year, after many months of hard work by its Infrastructure Assessment Committee, NASSCO released the 2018 Manual of Practice - Trenchless Technology and Asset Management.

Published in partnership with the Water Environment Federation, the Manual of Practice is useful for professionals new to the underground infrastructure industry, as well as experienced operators and inspectors. The manual includes both introductory and advanced topics in asset management, inspection, risk management, flow monitoring, pipe failure prevention, sustainable pipeline systems, bidding, specifications, as well as repair, rehabilitation and replacement methods using trenchless technologies.

First published in 1996, NASSCO's Manual of Practice has been an important industry tool for more than 20 years. During that time, significant industry changes have occurred and are reflected in the recent release.

While trenchless technologies have advanced, the purpose of the man-

NASSCO (National **Association of Sewer** Service Companies-is

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Sheila Joy is executive director of NASSCO. She can be reached at director@nassco.org.

ual has remained the same: to provide a baseline reference for a broad range of disciplines and to provide assessment steps and repair options available to municipal staff and engineers, contractors and consultants. The list doesn't end there, though; the manual is of extreme value to anyone wanting to know more about methods used in the assessment, maintenance and repair of underground infrastructure.

Assembled in an easy-to-read three-chapter format, each section targets important and timely issues to help achieve NASSCO's mission to set standards for the assessment, maintenance and rehabilitation of underground infrastructure and to assure the continued acceptance and growth of trenchless technologies.

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PRODUCT FOCUS

PIPELINE AND INFRASTRUCTURE, HYDRANTS

By Craig Mandli



COMPONENTS

I. PRIMEX MUNI

The **MUNI** from **PRIMEX** is a mechanically activated, narrow-angle, internally weighted municipal float switch suitable for level control in municipal sewage pumping stations. Other applications include stormwater lift stations, nonpotable water, pump up/pump down and programmable logic controllers. The internal switching mechanism contains gold cross-point contacts, providing precision and reliable control signals up to 1 amp. The three-wire cable Single Pole, Double Throw (SPDT) can be wired as normally open or normally closed. The float's large twin-wall teardrop-shape design offers increased buoyancy, and the two-color housing allows for easy identification of the float position. It is suitable for applications with high grease content and is CSA certified. **888-342-5753; www.primexcontrols.com.**

2. RELINER/Duran Inside Drop Bowls

RELINER/Duran Inside Drop Bowls and stainless steel pipe support brackets simply bolt to the manhole wall and can be cleaned and inspected from above, helping eliminate troublesome outside drops and clean up failed inside drops. The compact, low-profile bowls are available in dozens of sizes to fit any application. Modular Manhole Invert Channels improve manhole hydraulics, reducing maintenance, turbulence and odor. **800-508-6001;** www.reliner.com.

3. RIDGID Press Booster

The **RIDGID Press Booster** lets contractors press steel pipe up to 4 inches in less than 25 seconds. It builds on the power of the RIDGID RP 340, attaching to the tool to multiply its output for fast connections of larger-

diameter pipe when used with Viega MegaPress XL fittings. Simply attach the booster to the end of the press tool, press the trigger on the tool three times and you have a secure press connection. Hard-to-reach angles are easy with an actuator that can rotate 180 degrees on the press ring. Weighing less than 22 pounds and coming with built-in carrying handle and strap, the tool is designed for portability and easy transport. **800-769-7743;** www.ridgid.com.

HYDRANT

4. EJ WaterMaster 5CD350 fire hydrant

WaterMaster 5CD350 fire hydrants from EJ have all ductile iron construction supported by 3D modeling software and operation analysis to ensure performance. Each hydrant is rated for 350 psi working pressure and tested to 700 psi working pressure. It conforms to ANSI/AWWA Standard C502 and is Underwriters Laboratories Standard UL 246 listed. Its ductile iron conforms to ASTM A536. It is lubricated with FDA-compliant foodgrade lubricant. The bottom inlet and valve washer have NSF 61-certified fusion-bonded epoxy coating per ANSI/AWWA C550. Options include assembly to the city specifications, including color, a dust cap and the direction of opening. 800-626-4653; www.ejco.com.

5. Mueller Water Products Super Centurion A-403

The **Super Centurion A-403** hydrant from **Mueller Water Products** has a two-piece ductile iron upper barrel with a nozzle section that can be separated from the traffic section by removing two high-strength bolts, making seat replacement or traffic repair simple and quick. It has a traffic



flange, 5 1/4-inch fully encapsulated, reversible main valve, a durable polyurethane topcoat, and automatic oil lubrication. All internal components, nozzles and repair parts are fully interchangeable with the Super Centurion 250 hydrant. It is available with a three-way opening configuration (two hose nozzles/one pumper nozzle). This lightweight dry barrel fire hydrant is certified UL/FM/AWWA at 350 psi operating pressure and factory tested to 700 psi. **800-423-1323; www.muellerwaterproducts.com.**

PIPE

6. Advanced Drainage Systems HP Storm

HP Storm from Advanced Drainage Systems is a high-performance polypropylene pipe for gravity-flow storm drainage applications. It couples advanced polypropylene resin technology with a dual-wall profile design for performance and durability. The smooth interior wall offers additional strength as well as superior flow. It has an extended bell that adds an additional factor of safety within each joint. It meets or exceeds typical standards for pipe stiffness and joint integrity, and it meets ASTM F2881 and AASHTO M330 for the respective diameters. It is approved for use by the Army Corps of Engineers, Federal Aviation Administration, and American Railway Engineering and Maintenance-of-Way Association. 800-821-6710; www.ads-pipe.com.

7. GF Piping Systems ChlorFIT

The **ChlorFIT** piping system from **GF Piping Systems** has Schedule 80 pipe and fittings that are molded from CPVC Corzan resin. The system is certified by NSF for use with hot and cold potable water, and the resin is

highly resistant to heat, acids, alkalis, alcohols and many other corrosive materials. The Corzan resin has superior fire-resistant qualities, making the system ideal for applications that require ignited heat sources or are prone to fire. Available in 1/2- to 24-inch sizes with pressure ratings from 210 to 400 psi depending on pipe size, the system handles operating temperature from 32 to 200 degrees F. **800-854-4090; www.gfps.com.**

8. REHAU MUNICIPEX

MUNICIPEX cross-linked polyethylene water service line from **REHAU** in diameters up to 2 inches is a flexible, durable alternative to copper and HDPE. Offered in up to 1,000-foot coils that minimize joints, the lightweight pipe installs quickly and easily. It doesn't corrode or promote mineral buildup, assuring optimal water pressure for the long term. With the ability for native backfill and resistance to UV, slow crack growth, freeze-break, and abrasions, it surpasses alternatives with regard to resilience. **703-777-5255;** www.municipex.com.

PIPE PART/FITTING

9. Ford Meter Box Emergency Repair Clamp Kit

The **Emergency Repair Clamp Kit** from **Ford Meter Box** provides flexible pipe repair for a wide variety of pipe sizes. Covering most pipe diameters between 4.5 and 33.74 inches, this restockable kit equips any water utility for pipe emergencies. The kit contains various sizes of stainless steel bands with EPDM gaskets, an O.D. tape, a repair clamp sizing matrix and an O.D. chart. **800-826-3487; www.fordmeterbox.com.**

(continued)



PUMPS

10. BBA Pumps BA150E Trailer Pump Package

The 6-inch **BA150E Trailer Pump Package** from **BBA Pumps** is a dewatering pump that provides a capacity up to 2,090 gpm. Due to the large solid passage of 3.15 inches, combined with a grinding wear plate, the pump is also suitable for sewer bypass projects. The completely galvanized trailer is equipped with a large composite fuel tank. The lifting device also serves as a protective cover for pump and engine. The height of the pintle hitch can be adjusted, and the trailer is fitted with all the necessary safety provisions. **843-849-3676; www.bbapumps.com/us.**

11. Boerger BLUEline Rotary Lobe Pump

The **BLUEline Rotary Lobe Pump** from **Boerger** is a self-priming, valveless, positive displacement pump used to convey viscous and abrasive materials. There are 21 pump models in six series with pulsation-free operation, fully reversible rotation, dry-run capabilities and flow rates up to 7,500 gpm. The pumps are stable and wear-resistant with a maintenance-in-place design that allows for all wetted parts to be easily replaced through the front cover without the removal of pipe or drive systems. **612-435-7300;** www.boerger.com.

12. Flowrox LPP-D

LPP-D dosing pumps from **Flowrox** are designed to ensure accurate dosing in all process conditions, as the pump discharge flow does not depend on positive suction pressure. These pumps involve positive displacement pumping, which minimizes backflow. Their rolling design compresses the hose half as many times as a conventional shoe-design pump. Reducing hose compression by half creates lower operating costs by extending the hose lifetime and creates the capability to pump full time by minimizing

friction and heat. They can be used with a variety of diverse slurries and are suitable for dosing a wide range of abrasive, corrosive, viscous mediums such as lime, alum, sodium hypochlorite and ferric chloride. **410-636-2250; www.flowrox.com.**

13. JAECO Fluid Systems JaecoPAK metering pumps

JaecoPAK metering pumps from **JAECO Fluid Systems** are most commonly used for chemical metering and desalinization in multiple applications. They are available in both simplex and duplex configurations with pump capacities ranging from 0.38 to 150 gph at operating pressures up to 2,000 psi with an accuracy of plus or minus 0.5 percent. They are cast iron with a choice of 316 stainless steel or alloy 20 liquid ends with single ball or poppet check valves. Choose between neoprene, Viton or Teflon packing options and a single or three-phase 12- or 24-volt electric motor, gas-powered engine or belt-driven option. They are completely serviceable. **877-778-3456; www.jaecofs.com**.

14. Weil Pump stainless steel grinder pumps

Weil Pump has added five stainless steel models to its grinder pump offering. Ranging from 1 1/4- to 3-inch discharges, the 2- and 3-inch models can also be paired with an all-cast stainless quick-removal system. With heads to 100 gpm, solids are reduced to 3/8 inch in diameter by the 440C stainless steel grinder cutter and shredding ring components, which are hardened to Rockwell 58C. The semiopen impeller is available in cast iron or bronze and is sized to efficiently pump slurry at flows and pressures determined by the system design. The grinder component consists of a hardened rotating cutter mounted on a stainless steel motor shaft. A stationary shredding ring is positioned in the pump inlet. Pump models available in stainless steel construction include the 2105S, 2516S, 2516S (Style C impeller), 2526S and 2526S (Style C impeller). 262-377-1399; www.weilpump.com. ◆

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Reinforced polyethylene system solves overflow issues

Problem:

The existing Lakewood Lift Station at Lakewood Park located in St. Charles, Missouri, is an emergency lift station that operates only during high flows. Even with the station operating, some area manholes were still experiencing overflows in times of exceedingly high flow. Public Water Supply District 2 deter-



mined that the best solution would be to construct a new collector station and an additional sanitary sewer overflow tank to take flow away from the underlake sewer system where the existing lines were below capacity, alleviating the current overflow problems.

Solution:

As part of the improvements, **DuroMaxx SRPE** from **Contech Engineered Solutions** was chosen for the design of the in-line storage of sanitary sewerage required for the project. The engineering team at Hanson Professional Services designed the SSO system as a 96-linear-foot-long, 72-inch-diameter, single-barrel in-line tank.

RESULT:

Having had previous experience with DuroMaxx SRPE as a tank solution, the design team at Hanson Professional Services knew it would be a good solution to capture sanitary effluent in this application. The product has continued to perform as designed. **800-338-1122;** www.conteches.com.

Plant eliminates chronic clogging with pump system

Problem:

The Suffolk County (New York) Department of Public Works was facing ongoing interruptions to pumping operations as a result of ragging, where a buildup of fibrous materials was leading to frequent pump blockages at their Stony Brook Pump Station. Clearing a pump is a costly, dirty and unpleasant task that required a maintenance team and often a crane. They were looking for a reliable, efficient solution that would eliminate this challenge and deliver cost-savings.



Solution:

Flygt - a Xylem Brand proposed swapping one of the existing pumps in the duplex station with a new **Concertor**, a wastewater pumping system with integrated intelligence. Department of Public Works personnel simply removed one pump from the station and installed the Concertor in its place as the lead pump. A factory technician then installed the controller and input the settings. The entire process only took about one hour.

RESULT:

The Concertor delivered continually clean wet wells, clog-free operation and reduced unplanned vacuum cleaning callouts. With close monitoring, the system's benefits quickly became apparent. After a year of operation without any incidents of clogging, no cleaning has been required, and they had realized a 25 percent energy savings. **855-995-4261; www.flygtus.com.**

Submersible chopper pump stands strong through tropical storm

Problem:

The main lift station serving the wastewater treatment plant in Morgan's Point, Texas, experienced problems with its three standard nonclog pumps. The pumps frequently clogged with shop rags, pieces of lumber, plastic bottles, gloves and wet wipes when rainfall reached or exceeded



2 inches. Over seven years, these issues required the city to spend \$100,000 for pump maintenance and service.

Solution:

The city installed a **Vaughan SE-Series** submersible chopper pump, along with a complete guide rail system to solve the problem.

RESULT:

After the pumps were installed in July 2016, the city experienced more than 100 inches of rain with no plugging or other issues. During Hurricane Harvey in 2017, the pumps ran continuously for 72 hours without incident. "I just wish we had purchased these pumps years ago to eliminate the maintenance headaches we endured and the costs we incurred keeping our previous pumps in operation," says Brian Schneider, city administrator. "If the former pumps were still installed, residents would have had sewage in their homes." **888-249-2467; www.chopperpumps.com.**

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PRODUCT NEWS

FEBRUARY 2019

Product Spotlight

Directional drilling in a compact package

By Craig Mandli

arge utility installation, especially in urban environments, can be tight work. Ditch Witch recently rolled out the JT20XP package that aims to provide better productivity on those installation jobs while retaining a compact footprint.

The full package features a JT20XP directional drill and XP44 mixing system. According to Ditch Witch, the solution is the only drilling system in its class to utilize all-onboard horsepower for thrust and rotation. Together, the full 118 hp system provides operators power and productivity for medium to large utility installation jobs.

"We designed the JT20XP package to complement the unique needs of HDD contractors in the midsized utility-installation space," says Seth Matthesen, Ditch Witch HDD category manager. "The JT20XP drill provides improved spindle torque and speed over its predecessor while delivering 56 percent more mud flow than competitive units."

The package offers a compact design, making it easy to maneuver and transport between urban job sites. And it offers contractors an all-diesel job site for more convenient operations and simple fuel service.

Powered by a 74.5 hp Tier 4 Deutz diesel engine, the JT20XP HDD maximizes available horsepower for thrust and rotation. The drill delivers 14 percent increased spindle torque over its predecessor and offers 10 percent



increased spindle speed than competitive units, allowing operators the ability to run downhole tooling at faster speeds for improved underground cutting.

With no grease zerks, the JT20XP is easy to maintain for increased uptime. And the environmentally friendly Tier 4 engine requires no diesel exhaust fuel, further simplifying maintenance. The XP44 mixing system is equipped with a dedicated 44 hp Tier 4 Yanmar diesel engine for ideal mixing capabilities and drilling fluid delivery. As a powerful stand-alone, diesel-powered mixing system, the XP44 offers mixing capabilities in a quieter package for less disruption in noise-sensitive areas.

"The XP44's superior mixing capabilities offer a more productive solution for larger jobs while retaining a small, compact footprint," Matthesen says.

Following a similar look and feel to all Ditch Witch drills, the JT20XP is equipped with a newly designed operator's station featuring ergonomic, adjustable seats to keep the operator comfortable for long hours on the job. An advanced color LCD provides engine diagnostics and informational messages, including electronic strike indicators, helping operators stay aware of what's going on in and around the drill and job site. **800-654-6481; www.ditchwitch.com.**

Water Cannon 19K02 portable skid pressure washer

The 19K02 portable skid pressure washer unit from Water Cannon Inc. -MWBE is a totally self-contained system designed to fit into the 6-by-6-foot box of a pickup truck. Forklift slots and a lifting eye make loading easy and efficient. There is also a built-in winterization system, making year-round cleaning and transportation possible. It features 4



gpm at 3,500 psi and has a 14 hp Kohler gas engine with key start. The unit has a powder-coated frame, 225-gallon poly water tank, 10-gallon winterization system, stainless steel unitized valves and a Thermo Pump Protector that engages at 140 degrees F. It also comes with a manual hose reel and five spray nozzles. **800-333-9274; www.watercannon.com.**

CUES QuickZoom III video inspection pole camera

The QuickZoom III from CUES is a lightweight, portable, wireless digital video inspection pole camera that can be operated by one person. It is designed to provide cable-free safe viewing in industrial or environmental areas with no-man entry, such as pipelines, wet wells, manholes, steam generators, tanks and vessels. The camera can also be used to locate lateral services or to identify blockages at manholes, access ports or other entry points without entering the line or structure. The QZIII is mounted



on a carbon fiber adjustable telescopic pole that can extend up to 30 feet. The 1,080 pixel digital camera features a 360-to-1 zoom with built-in image stabilization, automatic focus and can be operated using a tablet. It also includes distance-to-defect with laser and is powered by batteries that last over five hours on a charge. **800-327-7791; www.cuesinc.com.**





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Randall Dellaposta, Director of Equipment and Facilities at the Genesee County Road Commission (GCRC)



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A.Y. McDonald Adjustable Meter Pit

The 795 Series Top Adjustable Coil Meter Pit Assembly from A.Y. McDonald has the ability to be adjusted at the top after the pit has been installed. This patent pending product is designed to provide up to 18 inches of adjustability on 15- and 18-inchdiameter PVC due to the addition of a molded poly top onto the PVC pipe. The Meter Pit Assembly makes it easier to set the top of the pit to the final grade, which leads to an added convenience and timesavings in the field. 800-292-2737; www.aymcdonald.com. +



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Trio-Vision licensed to use Envirosight technology

Trio-Vision announced it has secured a license from Envirosight to manufacture and market manhole camera inspection devices that incorporate certain technologies and methods patented by Envirosight. The inspection products will be developed and sold worldwide under the product brand name XPlorer.

StoneAge welcomes new sales team member

StoneAge announced that Yea-bin Jo joined the sales team and will support its customers and dealers in Japan and South Korea. She comes from SUNGBO Hydro Engineering with a background in international trade and is proficient in translation and interpretation.

HammerHead Trenchless and Per Aarsleff announce partnership

HammerHead Trenchless, based in Lake Mills, Wisconsin, and Per Aarsleff Pipe Technology of Aarhus, Denmark, have signed a long-term, strategic partnership agreement that includes plans for HammerHead Trenchless to produce and distribute the Bluelight LED Curing System for CIPP to markets outside of Europe and Russia.



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see photos in color at www.mswmag.com

DEWATERING

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POSITIONS AVAILABLE

JOB OPENING: Hammond Indiana Waste Water Treatment Plant (Hammond Sanitary District) has an opening for a Superintendent of Maintenance. Job requirements: Masters of Science in an Engineering field, Bachelor of Science in Mechanical Engineering, Professional Engineering license, Licensed Wastewater Treatment Plant Operator, Work experience in a wastewater treatment plant and a machine shop, Experience with CMMS and spreadsheet analysis and able to complete financial analysis. Job Responsibilities: Maintenance, rebuilding, reconditioning and alterations on all mechanical, electrical and supporting process control equipment. Responsible for the movement of mass through the wastewater plant 24/7, 365. Direct necessary repairs quickly and economically. Anticipate these repairs by employing Preventative Maintenance and Condition-based Maintenance actions. Maintain a professional approach to failures with focus on root-cause. Identify weak and troublesome systems and recommend modifications accordingly. Review all proposed plant improvements for future maintenance requirements, supervise all new equipment installations. Existing Buildings and Grounds: complete repairs and minor alterations to buildings, including roofing, painting, HVAC, plumbing, roads and fences. Equipment Inspection: responsible for all aspects of equipment health, mechanical, electrical, hydraulic and pneumatic. Storekeeping and Purchasing: Track and keep proper spare parts inventory. Specify and purchase materials as needed, identify and plan for long lead time items. Accounting: track all costs associated with maintenance. All purchases are entered daily into prepared spreadsheets, this same data, along with labor costs, are tracked using management software programs. Direct expenditures of a 5-million dollar annual budget. Able to prioritize projects based on operations importance, cost, duration of work and return on investment. Diagnose cause of problem/frequency of occurrence, the total effect of treatment effectiveness and maintenance cost. Performs related duties as required. Facility Information: 48MGD wastewater treatment plant with main Headworks pumping station, bar screening, grit removal, primary clarification, aeration

tanks, secondary clarification, tertiary filtration and disinfection. CSO Basin for storm events, sludge thickening units, anaerobic digesters, belt filter presses and sludge storage facilities. Major equipment used includes submersible pumps, centrifugal pumps, positive displacement lobe pumps, mixed flow pumps, constant speed blowers, liquid ring and sliding vane gas compressors and vacuum delivery of gas disinfection chemicals. Maintain all 44 outlying pump stations, as well as forcemains. Send letter of interest along with qualifications to: Marty Wielgos, District Manager, Hammond Sanitary District, 5143 Columbia Avenue, Hammond, Indiana 46327; 219-853-6413 EXT: 502 (M02)

SERVICE/REPAIR

Dynamic Repairs - Inspection Camera Repairs: 48 hour turn-around time. General Wire, Ratech, RIDGID, Electric Eel Mfg., Gator Cams, Insight Vision, Vision Intruders. Quality service on all brands. **Rental** equipment available. For more info call Jack at 973-478-0893. Lodi, New Jersey. www.dynamicrepairs.biz (MBM)

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USED Envirosight ROVVER Sewer Inspection Crawler: Overhauled with new parts and ready to run. Includes automatic cable reel, pan/tilt/zoom camera, steerable 6-wheel-drive tractor with various wheel sets, controls, and accessories. \$20,000. Call 973-252-6700. (MBM)

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WORTH NOTING

PEOPLE/AWARDS

The Tahoe Regional Planning Agency recognized exceptional projects completed in 2017 with the Best in Basin awards in 2018. Among the recipients were:

- Kings Beach Commercial Core Improvement: Placer County (California) and partners overhauled 1 mile of state Route 28 in Kings Beach and improved roads in neighborhoods adjacent to the commercial core. The project accomplished several goals, including installing infrastructure to fix drainage issues and capture and treat stormwater runoff that harms Lake Tahoe's clarity.
- Meyers Stream Environment Zone/Erosion Control: El Dorado County (California) installed stormwater improvements along several roadways, diverting stormwater to public lots where it can infiltrate into the ground and to restore a 3.5-acre wetland.

The Design-Build Institute of America announced the winners of its 2018 National Design-Build Project/Team Awards competition. The **RM Clayton Water Reclamation Center Headworks** (City of Atlanta Department of Watershed Management) received the National Excellence Award. The facility provides a first line of defense in wastewater treatment as it collects and treats flows from a combined stormwater and sanitary sewer system.

Heather Hall, King George County's zoning administrator, received the Achievement Award from the Virginia Association of Zoning Officials. She



also is the administrator for programs involving stormwater management, erosion and sediment control.

Naperville Park District was recognized by the Illinois Association of Park Districts with the 2018 Best Green Practices Award, which honors the district's accomplishments in several categories including stormwater management.

Integrated design firm **LPA** received the Award of Excellence in the American Society of Landscape Architects-Southern California Chapter's 2018 Quality of Life Awards for the design of interactive outdoor learning environments for Tarbut V'Torah, a community day school in Orange County. The design for Tarbut V'Torah turns sustainability into a functional learning experience, with a stormwater retention and treatment system.

CALENDAR

March 5-8

American Water Works Association and Water Environment Federation Utility Management Conference, Renaissance Nashville Hotel, Nashville, Tennessee. Visit www.awwa.org.

March 14-16

National Utility Contractors Association Annual Convention & Exhibit, Naples Grande Beach Resort, Naples, Florida.Visit www.nuca.com.

March 23-27

American Water Resources Association Spring Specialty Conference: Setting Conditions for the Success of Integrated Water Resources Management, Embassy Suites by Hilton, Omaha, Nebraska.Visit www.awra.org.

May 19-22

American Public Works Association North American Snow Conference, Salt Lake City, Visit www.apwa.net.

June 9-12

American Water Works Association ACE19 Annual Conference & Exposition, Denver; Visit www.awwa.org.

June 16-19

American Water Resources Association Summer Specialty Conference: Improving Water Infrastructure Through Resilient Adaptation, Nugget Casino Resort, Sparks, Nevada. Visit www.awra.org.

July 7-10

American Society of Agricultural and Biological Engineers Annual International Meeting, Boston Marriott Copley Place, Boston.Visit www.asabe.org.

Sept. 8-11

American Public Works Association Public Works Expo (PWX), Washington State Convention Center, Seattle. Visit www.apwa.net.

Sept. 9-11

National Rural Water Association WaterPro Conference, Nashville, Tennessee. Visit www.nrwa.org.

Oct. 9-13

American Society of Civil Engineers Annual Conference, Miami. Visit www.asce.org.

Nov. 3-7

American Water Resources Association Annual Water Resources Conference, Sheraton Hotel, Salt Lake City. Visit www.awra.org.

Municipal Sewer & Water invites your national, state or local association to post notices and news items in this column. Send contributions to editor@mswmag.com.



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