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December 2014

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PEOPLE TO STICK AROUND

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AHEAD OF THE STORM

Evanston's innovative and
proactive approach to
stormwater management
eases the strain of
major rain events

PAGE 12

Dave Stoneback,
Utilities Director for
the City of Evanston,
in Evanston, Ill.

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INSIDE:

CLEANING AND MAINTENANCE



ON THE COVER:

City of Evanston (Ill.) Utilities Director Dave Stoneback and the Evanston Utilities Department Sewer Division have employed a variety of tactics in their battle against stormwater overflows, including new sanitary sewer lines, new relief sewers and flow restrictors that prevent storm drain overloads. (Photography by Rob Hart)



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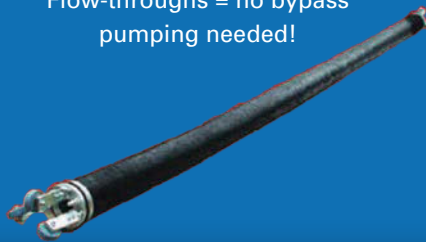
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FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE PROFESSIONALS

Published monthly by:



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



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Office hours Mon.-Fri., 7:30 a.m.-5 p.m. CST

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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 reprints, call Jeff Lane at 800-257-7222 (715-546-3346) or email jeffl@colepublishing.com. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicole@colepublishing.com.

CIRCULATION: 2013 average circulation was 40,000 copies per month (U.S. and international distribution).

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THINK FORWARD

Innovative ideas and a progressive management approach separate the top utilities



FROM THE EDITOR

Luke Laggis

Another year is nearly in the books. Christmas is just a few days off as you're reading this, but the leaves in northern Wisconsin are still bearing the full colors of autumn as I write it.

I point that out because I just returned from WEFTEC in New Orleans where I got a first look at some new products and talked to a lot of bright people from across the industry. So much is being written about the poor state of our infrastructure and growing demands on water resources, but there is a lot of innovation and forward thinking in this industry.

That's the underlying theme running through the profiles in this issue of *MSW*: innovation and forward thinking.

Altamonte Springs, Fla., is a great example. The city, located just north of Orlando, implemented one of Florida's first reclaimed water projects in the late 1980s. And unlike some cities, where reclaimed water is diverted to a few large customers, Altamonte Springs makes reclaimed water available to all of its customers.

But perhaps the greatest innovation came years later as the Florida Department of Transportation was planning a significant expansion of Interstate 4 that would have included several large retention ponds and other stormwater features. At the same time, nearby Apopka was looking to reduce its reliance on groundwater and had recently built new water storage reservoirs to meet projected demand.

So, Altamonte Springs worked with Apopka and the FDOT on a unique plan to capture stormwater runoff and distribute it – after treatment – through its reclaimed water system. When complete, the project will reduce stormwater runoff, take stress off the aquifer and substantially reduce pollutant loads being introduced into the Little Wekiva River.

Evanston, Ill., has also taken an innovative approach to stormwater management. In response to years of problems after heavy rains, the city approved a Long Range Sewer Improvement Program that included a new system of relief sewers and additional storm sewers. The plan also called for the installation of flow restrictors in streets and alleyways throughout the city.

The restrictors and the relief sewer system work in tandem. The innovative approach of partial sewer separation combined with street flow con-

So much is being written about the poor state of our infrastructure and growing demands on water resources, but there is a lot of innovation and forward thinking in this industry.

trol was more cost-effective than installing a totally new separate storm sewer system throughout the entire city. It also received awards: the Pisces Award in 2006 for innovative use of the Illinois Clean Water Act Revolving Fund for water-quality improvements, and the 2009 Illinois Section Award from the American Society of Civil Engineers.

Innovation and forward thinking takes a different course in Denton, Texas, where asset management has been raised to an art form. The utility's layered and sophisticated computerized maintenance management system has created a "warehouse of data" that officials can use to target potential problems and address maintenance and repair work in the most efficient manner possible.

In April 2014, the Water Environment Association of Texas gave Denton its annual Sidney L. Allison Award recognizing the utility's asset management program for how it's improved productivity and service for the Denton Wastewater Collection System and its customers.

All three of these utilities have looked beyond the status quo and found better ways to meet the needs of their customers. They're all doing great work, and I hope you find their stories beneficial.

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.

A photograph of a winter forest scene with snow-covered trees and a soft, hazy background.

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and throughout
the new year.

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TRUE GRIT

The I01 On Dry Abrasives

One of the costliest aspects of relining potable water pipes is creating a pipeline bypass system. Find out how a waterless system speeds up the relining process by using dry abrasives to clean water pipes, leaving dry pipe surface for the new liner. Take a look at the before and after pictures of the process, and read first-hand experiences from several municipalities. mswmag.com/featured

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OH, RATS

Top Cities for Sewer Varmints

Ever since there have been sewers, there have been sewer rats. Fortunately for homeowners, those beady-eyed bandits stay subterranean most of the time. Unfortunately for you, you've probably encountered them while working below the surface. Find out which city gained the title of "Rattiest City in America," and learn more about programs aimed at controlling the problem. mswmag.com/featured

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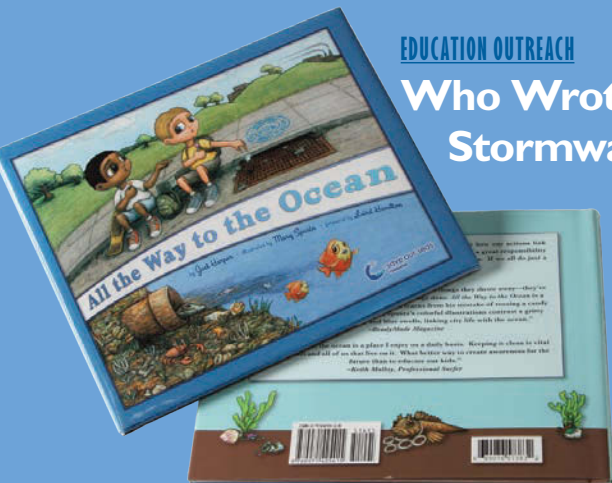
OVERHEARD ONLINE

“The flow restrictors have really protected our basements from back-ups. They cause stormwater to stay on the street and move about two blocks to drains in our relief storm sewer system.”

— *The Flow Restrictor Solution*
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EDUCATION OUTREACH

Who Wrote the Book on Stormwater?



More than a children's story, *All the Way to the Ocean* has been adopted by municipalities as part of educational outreach programs. Together with schools and nonprofit organizations, communities such as Santa Maria, Calif., Sugar Land, Texas, and Kitsap County, Wash., have successfully spread the word about stormwater runoff. Learn more about the book and how it can be used to fill MS4 requirements. mswmag.com/featured

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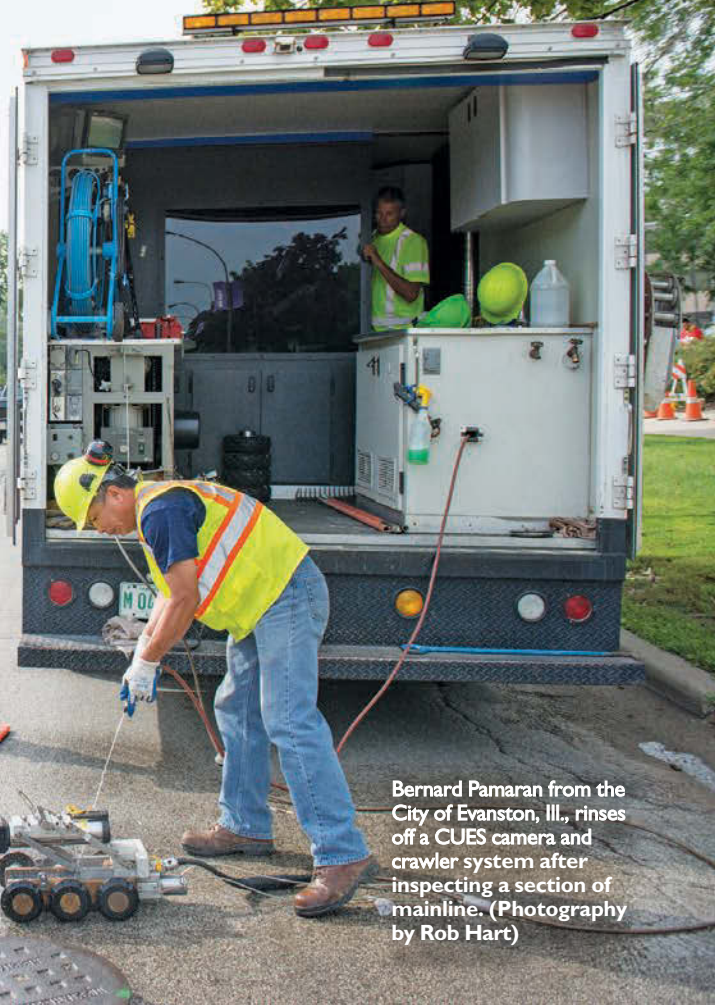
Vaporooter refers to Sanafoam Vaporooter II, a restricted use pesticide.



AHEAD OF THE STORM

Evanston's innovative and proactive approach to stormwater management eases the strain of major rain events

By Jim Force



Bernard Pamaran from the City of Evanston, Ill., rinses off a CUES camera and crawler system after inspecting a section of mainline. (Photography by Rob Hart)

Evanston, Ill., has launched a three-pronged attack on stormwater overflows, but the increasing frequency and intensity of rain events is making the task more challenging.

Plagued for years with flooded basements and customer complaints, the utility has built a new system of stormwater relief sewers, added several new storm sewers, and installed flow restrictors which prevent storm drain overloads by forcing stormwater to pass down the street or alleyway to larger drains.

And while the system works well, Utilities Director Dave Stoneback says the heavier rainfalls the city has experienced in recent years can still cause flooding problems, especially in winter. A heavy rain last February on top of several inches of snow was especially problematic since the snow blocked storm drains and there was nowhere for the water to go.

"We used to talk about a 10-year storm event, but now it seems like it's occurring every year. And the

storms are more intense," he says. "There's no question we're seeing a changing climate."

A 200-mile collection system

Evanston does not own or operate its own wastewater treatment plant. Instead, the community sends its wastewater to the Metropolitan Water Reclamation District (MWRD) of Greater Chicago's North Side Treatment Plant, a relationship Stoneback calls a "good partnership."

That frees up the Evanston wastewater utility to concentrate its efforts on operating and maintaining the city's 200-mile-long system of combined sanitary sewers, stormwater relief sewers and separate storm sewers.

"Our crews are responsible for preventive and routine maintenance on all three different sewer systems," explains Stoneback. These systems are composed of sewer mains ranging from 6 to 120 inches in diameter and include over 5,500 manhole inspection structures and over 9,000

drainage structures. The majority of the combined system is constructed of vitrified clay, with the larger-diameter pipes constructed of brick or segmental clay tiles.

"We have our own [CUES] TV truck," Stoneback says. "We inspect our drainage structures first, then the sewer pipes. Generally, we only TV under streets that are due for resurfacing the next year. That's about 3 miles every year.

"We like to fix any problems before the resurfacing takes place," he explains.

The Evanston team uses two Vac-tor combination sewer cleaning trucks, cleaning all drainage structures once every three years, operating on a third-third-third schedule. All sewer lines 24 inches and smaller are cleaned once every four years – all with in-house personnel.

When sewers need repair or replacement, Evanston relies primarily on cured-in-place pipe technology, using prequalified outside firms. "We've been using CIPP since the

early 1980s," Stoneback says. Current contractors include SAK, Michels, Insituform, Kenny and Visu-Sewer.

Annually, the city spends about half a million dollars on smaller-diameter (24-inch or less) sewer repair and replacement projects. For lining the larger-diameter sewers, 48-inch diameter or larger, Evanston has relied on low interest loans from the state revolving loan fund. "We just finished a \$1.8 million project mostly using CIPP," Stoneback says, "Where it's advantageous on larger pipes, we will use slip-lining with fiberglass [HOBAS Pipe USA]."

If the pipes are too out-of-round, or broken, crews will use open-cut trenching methods, soliciting bids from a range of qualified suppliers.

As for manholes, Stoneback says the maintenance crews keep an eye on them when they're doing the pipeline cleaning. The city's sewer schedule enables the crews to observe individual manholes at least once every three years.

(continued)

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“We used to talk about a 10-year storm event, but now it seems like it’s occurring every year. And the storms are more intense. There’s no question we’re seeing a changing climate.”

– Dave Stoneback

Taking on stormwater

So far, so good, but Evanston must fight special battles against stormwater overflows. While the average citizen might rely on an umbrella for protection, Evanston employs a full toolbox of solutions, including improvements to the sewer system and flow restrictors. In addition, it’s investigating green methods like porous pavement and rain gardens.

Since 1985, Evanston has used a 250-foot-deep tunnel (part of the MWRD of Chicago’s deep tunnel system) to store combined sewer overflows. During heavy rains, however, Evanston residents continued to experience

basement backups and property damage.

In 1990, the Evanston City Council approved a Long Range Sewer Improvement Program that included the installation of larger-diameter relief sewers that could convey stormwater and overflows to the deep tunnel, as well as an extension of the existing storm sewer system into the north central and east side of the city to convey surface drainage directly to the North Shore Channel – a surface impoundment. The plan also called for the installation of flow restrictors in streets and alleyways throughout the city.

The new relief sewer system consists of 8.75 miles of shallow, 60-foot-deep tunnels ranging in size from 60 to 120 inches in diameter and 39 miles of sewers 6 to 54 inches in diameter. The design was based on complete drainage of street flooding during a five-year storm and only minimal flooding in isolated areas during a 10-year storm.

Restricting and redirecting flow

The Reg-U-Flow restrictors come from Hydro International, and use a vortex motion to restrict the entry of water into drainage structures as the flow increases. They are positioned at hundreds of street curb drains throughout the city.

Under low flow conditions, the restrictors act as a large 2 1/2-inch orifice, letting water pass to the combined sewer system. When flow increases, however, the vortex action begins to throttle back the flow that is allowed to pass through the orifice. As head continues to increase, the valve discharge closes to a much smaller orifice, forcing stormwater to flow down the street for up to two blocks where it is intercepted by high capacity inlets that flow directly to the relief sewer system.

“The restrictors really protect our



From top to bottom: Bob Bauer of the City of Evanston Utilities Department guides a camera through a mainline inspection using CUES equipment in the control room of the utility’s inspection van; Bernard Pamaran (left) and Bob Bauer lift the camera out of a manhole after the inspection; Danny Cullen, bottom, and Shawn Pestka make repairs to an inlet and catch basin along a residential street in Evanston.

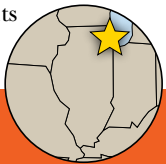
basements,” says Stoneback. “They keep the stormwater on the street and divert it to our relief sewers.

“They’ve worked well,” he adds. “They can clog, but maintenance has been manageable. Our crews use a two-part device that fits into the outfall pipe and pulls the vortex head up to the street. Their instal-

lation – all over the city – has been a money-saving event for us.”

Stoneback makes clear that the restrictors and the relief sewer system work together, in tandem. “We monitor results and find places where installing a restrictor into a drainage structure has caused unac-

(continued)



PROFILE:

**City of Evanston, Ill.,
Utilities Department,
Sewer Division**

DATE FOUNDED:
Late 1800s

POPULATION SERVED:
Approximately 75,000

AREA SERVED:
City of Evanston,
7.8 square miles, 12 miles
north of City of Chicago

CONNECTIONS: 14,400

**WASTEWATER
INFRASTRUCTURE:**
200 miles of sewer pipe,
ranging from 6 inches to
120 inches in diameter;
5,500 manholes; 9,000
drainage basins; wastewater
treated at North Side Water
Reclamation Plant operated
by the Metropolitan Water
Reclamation District (Greater
Chicago)

EMPLOYEES: 13

**ANNUAL OPERATING
BUDGET:**
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INNOVATIONS ON THE WATER SIDE

Innovation is not only the hallmark of the Evanston wastewater utility. The city practices forward-looking approaches on the water side as well and has been doing so for more than 100 years.

The water utility dates to the late 1800s. The town was a sleepy farming community until 1871 when refugees of the Great Chicago Fire moved to Evanston, increasing the population. Then in 1872, severe fires in Evanston further increased the need for an effective public water supply for firefighting. Drawing water from Lake Michigan, the community built its first pump station on property donated by Northwestern University, which remains the site of the current water plant.

Typhoid outbreaks in the early 1900s prompted the utility to begin disinfecting its water supply with chloride of lime, and in 1914, filtration was added to the water treatment process as another measure to combat the disease.

Today, 157 miles of water lines deliver the water to customers, and the plant treats 108 million gallons per day with conventional surface water treatment technology. Over half the lines are more than 80 years old, and Evanston has a program to upgrade 1.5 miles of old pipeline every year.

The city was one of the first to install a fixed base automated meter reading system in 2001. A SCADA system has monitored and controlled the water plant and distribution system since 1982, and Evanston has used an asset management system since 1986.

To counter the buildup of frazil/anchor ice at the mouth of its mile long inlet pipes into Lake Michigan, Evanston has successfully implemented a system of low-voltage heaters.

Still, state-of-the-art technology can't do it all, according to Utilities Director Dave Stoneback. "Technology can't replace good people," he says, "but it helps them work more safely and efficiently."

ceptable street flooding," he says. "In that case, we'll extend the relief sewer to that location."

According to the city's website, this innovative approach of partial sewer separation combined with street flow control was more cost-effective than installing a totally new separate storm sewer system throughout the entire 7.8-square-mile city area. In fact, the program, developed between 1991 and 2008, cost about \$210 million.

It also received awards: the Pisces Award in 2006 for innovative use of the Illinois Clean Water Act Revolving Fund for water-quality improvements and the 2009 Illinois Section Award from the American Society of Civil Engineers.

Going green

Like many other forward-looking municipalities, Evanston is considering green solutions as part of its stormwater management plan. It's in its infancy, as Stoneback explains it,

and includes porous pavement, rain gardens and rain barrels.

"We've put in a lot of porous pavement in the last couple of years and have had mixed results," he says. "In the parking lanes on Sheridan Road [a main drag], it's worked well, but in the downtown, it's not holding up as well. We're diagnosing why." He adds the city is installing porous pavement on selected residential streets where truck traffic is not heavy.

The city is also studying rain gardens, and has plans to develop one next to the parking lot at the municipal building.

Residents are encouraged to install rain barrels as well. "The MWRD has a good program in Chicago," Stoneback says, adding that Evanston would like to duplicate it. "We're hoping to find a contractor who would pick up the barrels and deliver them to the home site; they're really too big and cumbersome to load into your car."

He adds the city is also developing standards for installing and maintaining rain barrels.

Since the 1980s, a city ordinance has required that all roof downspouts be disconnected from the sewer system, but existing sump pump connections were grandfathered. Getting property owners to voluntarily move the pump discharge to the lawn rather than the sewer system is both a goal and a challenge.

"According to our calculations, if 18 sump pumps kicked on at the same time, that would overwhelm a 12-inch pipe," he explains. "We continue to talk to aldermen about this issue, and go to public meetings advising homeowners of the problems sump pumps can cause and encouraging them to discharge to their lawns."

Challenges ahead

Of course, at a municipal water and wastewater utility, the work never ends. As Stoneback and his department look ahead, they see continued funding and rehabilitation of existing infrastructure as serious challenges. But the biggest concern is climate change – the intensity and duration of storms and the city's ability to deal with them.

"People get tired of hearing about the 100-year storm because it seems to be happening every year," Stoneback says. "But our [weather] graphs are changing, we're getting more intense storms. We're learning that while our storm relief sewers are designed for the 10-year rain event, now it's every five or six years. It has caused our relief sewers to surcharge, resulting in more standing water on our streets."

More help is on the way, but it's probably years in the future. The MWRD has plans to build the McCook reservoir to be able to accept and store more stormwater from Chicago and other communities – like Evanston – which are served by the Deep Tunnel system.

"So much of our system is dependent on MWRD," says Stoneback. "They've helped us tremendously. But



Danny Pingue (left) and Jaime Vega use a Vector jet/vac truck to clean a storm drain.

until McCook is built, we'll probably still be susceptible to backups." ♦

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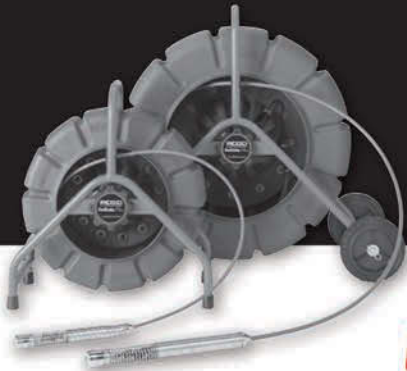
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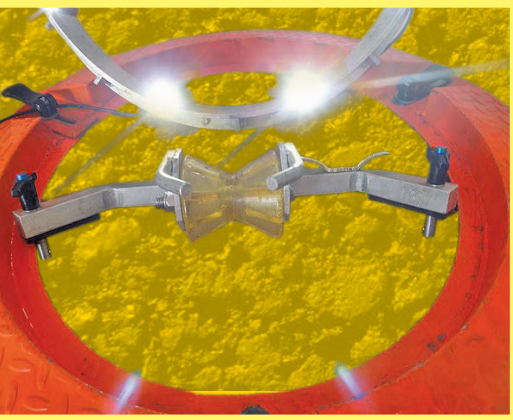
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LIGHTING THE WAY

Manhole lighting system sets up in seconds and provides a host of safety features

By Doug Day



It's a simple idea, one maybe you even thought of. But it took Shane Jacobson and a co-worker to pursue it: an aluminum ring that fits perfectly in a manhole opening with a set of LEDs to brightly light the work area.

"Driving home from a job one night, Paul Lewis mentioned that it would be nice if someone made a light ring so we wouldn't have to stand there with a flashlight," says Jacobson.

A quick check revealed that nobody else made one, so they invented the Light Ring. With the help of Jacobson's cousin, Gavin Gross, they patented the invention and are now starting to market it. "We developed the idea a little more and turned it into a multi-use safety and efficiency device rather than just a ring with lights on the bottom."

Jacobson owns Central Iowa Televising in McCallsburg, Iowa, with his father, Kevin. He has also formed Light Ring Inc. "Nighttime emergency calls are going to be a lot easier," says Jacobson, adding that the better visibility will also help with safety and efficiency during daylight hours and will help prevent banging cameras, jetters and other equipment against the walls. "If somebody else had this on the market, I'd be hot on it."

Simple design

The ring comes in standard manhole sizes and has eight LED lights powered by a lithium-ion battery with a five-hour charge. It can also be plugged directly into a power source from a vehicle. There is an adjustable safety ring to fit multiple sizes and a detachable downrigger to protect cable and jetter hoses. Other attachments are being developed.

Setup takes just a few seconds. "You just pop the manhole cover, drop the Light Ring in the opening and place the safety ring on it – you're ready to start working," says Jacobson. "You're not dropping spotlights in

or using flashlights. We go through 10 or 15 spotlights a year. People drop them or break them, or they get wet and stop working. This eliminates that cost."

One Light Ring set retails for about \$1,500 to \$2,000 depending on size and attachments. The Light Ring was prototyped by Mid Iowa Machine and is manufactured by Tom Christian and Sawyer Hjortsvang, owners of Mid-Iowa Machine. Production may be outsourced to other U.S. companies as demand grows.

Easier than expected

It took less than a year to perfect the idea and file patent applications. Jacobson then set up field demonstrations with some local communities.

"Everyone thinks getting a patent is ridiculous amounts of money and lots of time and work. But if you have a basic concept, a drawing of the product you want to produce, and go to the right patent attorney that has actual experience with sewer patents – our process was pretty painless and there was minimal cost."

There will probably be other patent applications down the line, as well. "We have two patents

pending on this product so far," he says. And there may be others. "A company that works on ethanol plants wants us to build a rectangular version they can bolt on to the side of a fan unit."

Jacobson's father will be around more to help in product development since he just retired after 23 years as the water and wastewater superintendent in nearby Story City. He couldn't hire CIT for cleaning, jetting or sewer rehab work while he was in that position, says Jacobson. "But we've always had good feedback from him from the customers' view." He's looking at tapping into that perspective as development of the Light Ring continues.

"The biggest breakthrough in manholes since the ingenious design of the manhole," declares the company website (www.lightringinc.com). And it all started with an offhand remark in the cab of a truck. ♦

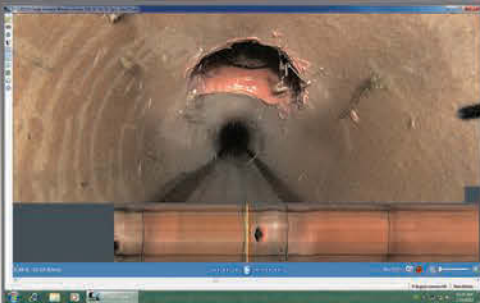
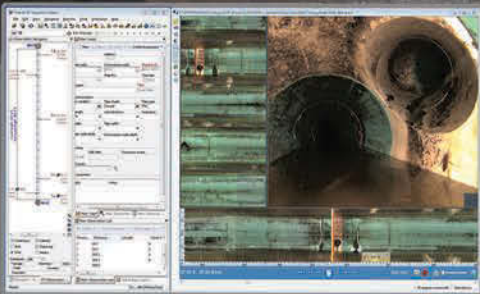
"You just pop the manhole cover, drop the Light Ring in the opening and place the safety ring on it – you're ready to start working. You're not dropping spotlights in or using flashlights."

– Shane Jacobson

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BE A MAGNETIC MANAGER

Limit the damage and expense of employee turnover and motivate the best people to stick with your organization

By Ken Wysocky

Here's an interesting factoid to chew on the next time your organization loses a great employee: Contrary to popular belief, it's usually not about the money.

According to a study performed by the Saratoga Institute, a leader in third-party exit interviewing, almost 90 percent of managers believe employees leave because they've found better-paying jobs. But the study also showed something far more startling: In reality, only 12 percent of employees actually leave for greater financial rewards. And for the remaining 88 percent, there's little doubt that bad managers play a strong role in prompting them to hit the road.

This remarkable disconnect between perception and reality lends credence to the old adage that employees join companies, but they leave managers. It also speaks volumes about the power of denial – how difficult it is for the very people charged with keeping employees engaged and on board to take responsibility for turnover. This is no small matter, given that some experts believe the cost of staff turnover stands between 50 to 150 percent of an employee's annual salary (depending on the role and level of seniority).

So what's the solution if the problem perhaps is, in a word, *you*? Perhaps you'll take some advice from consultant Mel Kleiman: Become a magnetic manager — the kind of leader who attracts good employees and keeps them with your company through thick and thin.

Kleiman is the president and founder of Humetrics (www.humetrics.com), a consulting firm in Sugar Land, Texas, that helps companies develop better hiring and retention strategies. He's also the author of *Hire Tough, Manage Easy: How to Find and Hire the Best Hourly Employees* and *The Five Firsts: A Simple System to On-Board, Engage and Retain Top Talent*.

Magnetic power

Kleiman says exit surveys show that employees desire the following five things from work: great co-workers, interesting work, growth and opportunity, a family-friendly environment and recognition. And magnetic managers can play a role in enhancing each of those areas by hiring great people for jobs, establishing expectations, holding themselves and their employees accountable, communicating openly and giving credit where credit is due.

“Some people love to have their hands held and others just want you to give them a target and let them go at it. It's your job to manage them how they prefer to be managed. It helps hold both you and the employee accountable.”

– Mel Kleiman

“Magnetic managers only let great people in the door,” he emphasizes. “Don't waste your time on mediocrity – hiring great people will make your job much easier. And set expectations right away. ... Tell people what you want and what they should expect.”

Many supervisors overlook a simple but powerful tool in their managerial arsenal: recognizing an employee for a job well-done. “Our society is addicted to recognition,” he asserts. Yet a Gallup poll shows 60 percent of employees never receive it – even though it's an easy thing for managers to do, takes little time and doesn't have to cost even a penny.

When Kleiman speaks at seminars, he often asks attendees if they ever received a written letter of recognition from a manager.

“Out of 100 people, maybe 15 will raise their hands,” he notes. “And most of them know exactly where that letter is, whether it's framed and hanging on a wall or in their desk or in a file. That speaks to how valuable it is to them.”

Practice the five firsts

What happens on an employee's first day on the job is also critical to long-term retention. Anyone who dis-

putes that notion should consider the typical first question a new employee gets from a spouse or friends after that critical first eight hours on the clock: How was your day?

“The answer needs to be, ‘Fabulous,’” Kleiman asserts.

To ensure that response, he says managers should follow the first point in what he calls the Five Firsts: Make the first hour of the first day the best hour any employee will ever have on a job.

Most employees start on Mondays, which are feverishly busy. As a result, too many employees are asked to spend hours filling out forms, talking with human resources people or even just drinking coffee until their manager has time to pay attention to them.

“What you should do is ask the new employee to come in an hour early so you can have some uninterrupted time together,” he suggests, noting they usually are pleased by the special treatment. “You only get one chance to make a really good first impression. ... Make that first hour the best hour they ever had at work.”

During that hour, be sure to explain why the employee's job is important to the organization. Also tell them why they were chosen for the job

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day 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.

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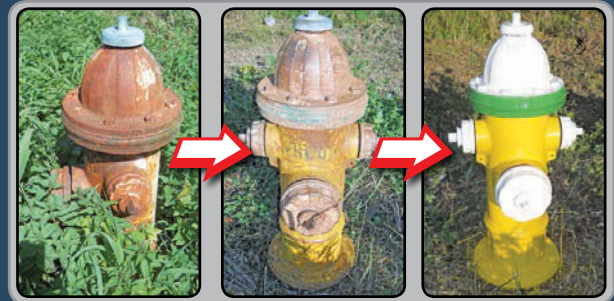
(which, as a bonus, establishes job expectations) and tell them what happens if they don't do their job well. Then find out how they want to be managed, which establishes an open line of communication, Kleiman says.

"Employees love to be asked how they want to be managed and managers should love hearing about it," he notes. "Some people love to have their hands held and others just want you to give them a target and let them go at it. It's your job to manage them how they prefer to be managed. It helps hold both you and the employee accountable."

Managers should also comply with the other four Five Firsts:

- Meet at the end of the first day to find out how things went. "Don't let them go home frustrated," Kleiman says.
- Do the same thing at the end of the first week. "The most important thing is communicate, communicate, communicate," Kleiman emphasizes.
- Give the employee their first paycheck in person, not via direct deposit into a bank account. "This gives you an opportunity to tell them first-hand all the good things they did to earn it," he points out. "Or maybe to tell them they need to turn it up a notch. If you're not honest, you're just setting them up for failure. How can you expect people to do things right if you're not telling them what they're doing wrong?"
- Meet again after 30 days to review the employee's first month on the job.

In closing, Kleiman points out that it's usually the best employees who leave for greener pastures. So to avoid this kind of damaging and costly turnover, managers should honestly take stock of their managerial shortcomings and address areas that require shoring up. Is it easy? No. Will it take discipline and effort? No doubt. But the reward is employees who stick to their managers like steel to a magnet, even if another company offers them a job with a higher salary. Remember, it's not always about the money. ♦



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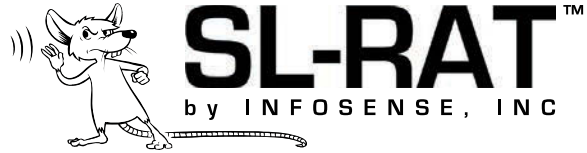
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ROAD TO SUSTAINABILITY

A quest for new supplies of reclaimed water led Altamonte Springs to a unique source: Interstate 4

By Peter Kenter

Florida has been a pioneer in the development of reclaimed water infrastructure. A new project developed by engineers at the Public Works and Utilities Department in the City of Altamonte Springs has taken that concept to a higher art form.

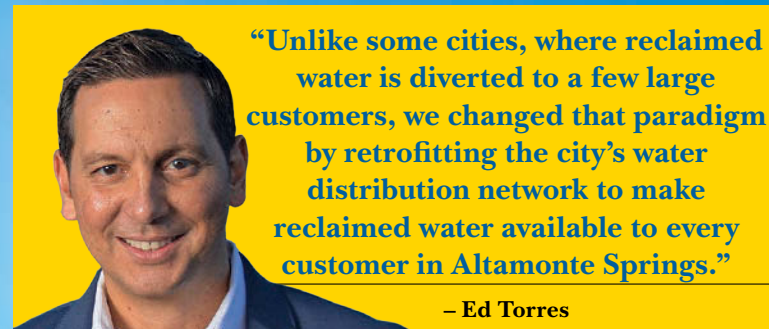
The city has partnered with the Florida Department of Transportation (FDOT) to capture and treat stormwater runoff from Interstate 4. The Altamonte Springs–FDOT Integrated Reuse and Stormwater Treatment (A-FIRST) project not only aims to create a reclaimed water supply totaling more than 4.5 mgd, but will also provide the nearby city of Apopka with up to 3 mgd of reclaimed water – for free.

Located a little more than 10 miles north of Orlando, Altamonte Springs implemented one of Florida's first reclaimed water projects in the late 1980s. Dubbed A Proto-type Realistic Innovative Commu-

nity of Today (APRICOT), the project still forms the nucleus of the city's reclaimed water system.

APRICOT's backbone is a 12.5 mgd regional water reclamation facility, which provides advanced sec-

ondary wastewater treatment for several adjacent municipalities and produces almost 100 percent of the reclaimed water used by the city.



ondary wastewater treatment for several adjacent municipalities and produces almost 100 percent of the reclaimed water used by the city.

Available to all

“Unlike some cities, where

reclaimed water is diverted to a few large customers, we changed that paradigm by retrofitting the city to a dual water distribution network to make reclaimed water available to every customer in Altamonte Springs,” says Ed Torres, director of Public Works and Utilities, which is responsible for the city’s water, wastewater, reclaimed water and stormwater in addition to roads, solid waste and recycling.

The concept for the A-FIRST

project dates back to about 2006, when city engineers saw a significant opportunity to produce more reclaimed water, take stress off the aquifer, reduce stormwater runoff and substantially reduce pollutant loads being introduced into the Little Wekiva River. However, the elements weren’t yet aligned to make the project happen.

The big disconnect?

“A key issue that affects these types of projects is that, unfortunately, utility engineers and stormwater engineers don’t talk to each other,” says Torres. “This is true in consulting and in the public sector. However, they both have the same goal – treating water. We were missing huge opportunities by working independently. I got the utility staff together and asked them to think a little differently.”

FDOT typically builds large retention ponds to capture stormwater runoff and planned to build addi-

(continued)



A general view of the water tower near Cranes Roost Park in Altamonte Springs, Fla. Cranes Roost serves as a regional stormwater facility. (Photo by Scott Miller) Far left: A crew from the City of Altamonte Springs Public Works and Utilities Department repairs a broken force main. Left: A crew uses a McElroy fusion machine to join segments of HDPE pipe for a sewer replacement project. (Photos courtesy City of Altamonte Springs)



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Cranes Roost Park serves as a regional stormwater facility for the City of Altamonte Springs. (Photo by Scott Miller)



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Utilities, City of
Altamonte Springs,
Fla.

**YEAR UTILITY
ESTABLISHED:**
1963

CUSTOMERS SERVED:
48,000 (water, sewer &
water, sewer only and
reclaimed water only)

AREA SERVED:
9.66 square miles (city)
plus 11.91 square miles
(St. Johns River Water
Management District's
Altamonte Service Area)

DEPARTMENT STAFF:
120 (including sanitation)
plus 3 GIS

INFRASTRUCTURE:
Potable water – 109.2 miles;
Reclaimed water – 105.4
miles; Sanitary – 144.5 miles

**ANNUAL DEPARTMENT
OPERATING BUDGET:**
\$41.1 million
(not including streets)

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Association, Florida Water
Environment Association,
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tional stormwater retention features as it embarked on the I-4 Ultimate Improvement Project, which will add four express lanes to the highway over a 21-mile length.

Eliminating stormwater ponds

“Those holes in the ground look awful and require regular maintenance,” says Torres. “Under our plan, FDOT could say goodbye to the expense of building the local retention pond. In addition, FDOT could eliminate construction of a 96-inch stormwater pipe and two bridges designed for flood compensation. By using additional skimmers, filtration, chlorination and the possible addition of flocculants, we could treat the highway runoff to reclaimed water standards.”

At the same time, nearby Apopka had also been looking to reduce its reliance on groundwater and had recently built new water storage reservoirs to meet the projected demand for the growing community.

“We made them an offer they couldn’t refuse,” says Torres. “We would send them our excess reclaimed water at no cost to them. They could either use it, store it or release it to the environment for aquifer recharge.”

Three main infrastructure projects would be required to complete the plan:

- A new reclaimed augmentation facility to provide treatment of supplemental reclaimed water delivered by Peerless pumps from the city’s Cranes Roost regional stormwater facility. The project would include filtration and disinfection and would deliver the supplemental water to the city’s reclaimed system via new high-service pump stations.
- Modification of Cranes Roost, to provide a range of flow capabilities to deliver stormwater to the reclaimed augmentation facility via a stormwater force main through the State Road 436 corridor. The stormwater basin at Cranes Roost alone could supply an average of 1.5 mgd of reclaimed water.
- Construction of a 6-mile pipeline to deliver excess reclaimed water to Apopka’s water reclamation facility. The pipeline would consist of pipes 16 to 24 inches in diameter, and include improvements to existing infrastructure.

Overcoming negativity

“I realized that this wasn’t a cookie cutter plan that I could just submit for a permit,” says Torres. “I heard a lot of negative comments: Someone tried that before and they couldn’t do it; it’s technically too difficult; you won’t be able to get the necessary permits; the land acquisitions and easements will kill the proj-

(continued)



Crews from the City of Altamonte Springs Public Works and Utilities Department work on different pipe replacement projects in coordination with the Neighborhood Enhancement Program. (Photos courtesy City of Altamonte Springs)

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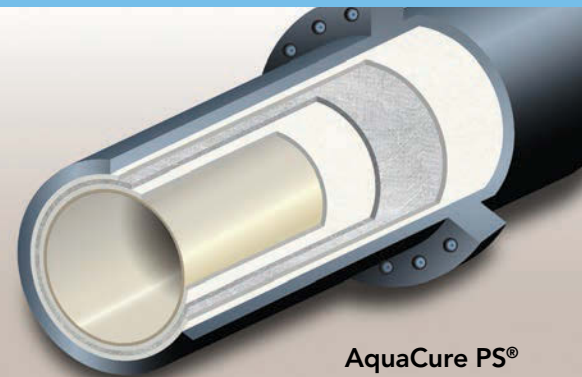


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A TALE OF TWO SYSTEMS

Public Works and Utilities in the City of Altamonte Springs has operated side-by-side potable and reclaimed water systems for almost 30 years.

The potable water system goes back to 1963 and features pipes ranging from 1 to 24 inches in diameter while the reclaimed system dates back to 1985, featuring pipes as large as 48 inches in diameter.

Pipes are made of a wide variety of materials, ranging from asbestos concrete and cast iron, to ductile iron, HDPE and PVC. In addition, some potable water pipes are made of galvanized iron and steel, but PVC, HDPE and ductile iron are the materials of choice for new installations.

"Condition of existing pipes varies with age and the material used, but we're pleased to say that everything is working well on both water systems," says Ed Torres, director of Public Works and Utilities with Altamonte Springs.

Despite the relative youth and good condition of both systems, unexpected breaks still present the utility with its greatest challenges – and associated unbudgeted expenditures. Breaks are often related to extreme rainfall, leading to soil erosion around pipes. Annual rainfall can top 52 inches, with afternoon storms dropping as much as 7 inches of rain.

Both systems have been thoroughly mapped using ArcGIS by Esri, and mapping information is shared across the system using ArcGIS Server.

Keeping infrastructure healthy

"To keep the system healthy, we employ proactive programs such as our Neighborhood Enhancement Program, which is designed to inspect and upgrade aging infrastructures in residential subdivisions," Torres says. "As an integrated public works and utility department, that includes roads, sidewalks and all water infrastructure."

Water audits comparing produced water and water used by customers also provide a strong tool for identifying any system leaks.

"The decision to complete repairs or new construction in-house is mostly based on the ability to complete work in a timely manner with the resources available to us," Torres says.

The utility relies on a stable of equipment to perform that work, including Bobcat skid loaders, John Deere excavators and backhoes and, on the sewer side, Vac-Con hydroexcavators, Harben jetters and a CUES CCTV system.

"We'll even perform directional drilling in-house," says Torres. "However, the emphasis is on our customers. If using a contractor is in their best interests, then the decision is made to use a contractor."

ect; and you won't meet the schedule. I realized we needed to find open-minded champions to make it happen."

The utility sought any opportunity to present the plan to members of FDOT, the Florida Department of Environmental Protection and the St. Johns River Water Management District in order to shore up support for the project.

"Bit by bit and issue by issue, we developed a coalition of support," says Torres. "Once FDOT came on board, it not only agreed with our plan but agreed to fund almost half of the project based on their \$15 million in savings from eliminating the retention ponds and bridges."

In addition, A-FIRST would reduce stormwater river discharges

and eliminate an average of 643 pounds per year of total phosphorus (TP) and 3,259 pounds per year of total nitrogen (TN) loading to the Little Wekiva River. That includes 145 pounds of TP and 634 pounds of TN that would have been generated by construction of the I-4 Ultimate project alone.

Once funding and approvals fell into place, the project proceeded rapidly.

"In just over a year, the project went from concept alone to fully permitted with a construction contract awarded," says Torres. "Ground was

broken this summer and the system is scheduled to be fully functional by August 2015."

Torres' advice to utilities planning similar approaches to highway stormwater runoff?

"Arm yourself with perseverance and determination," he says. "It was initially difficult to get my staff and the consultants to break outside the mold and see the overall project vision, but once they did, they never looked back. This project showcases the opportunities that exist when organizations look beyond tradi-

tional ways of solving the same old problems. The technology we require to do better and greater things is here now." ♦



LEFT: This reclaimed water pipe in the City of Altamonte Springs was located under several trees and was found during the Neighborhood Enhancement Program. **ABOVE:** Public Works and Utilities Department crew members work to repair a force main break. (Photos courtesy City of Altamonte Springs)

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While the educational opportunities are valuable and popular, the show really ramps up on Tuesday when the exhibit hall opens. Every year, products introduced at the show become important components in many industry professionals' toolboxes and equipment fleets. More than 8,700 people representing 3,800 companies attended the 2014 show, with 529 exhibitors nearly spilling out of the exhibit hall.

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Education Day Sessions

Monday, February 23, 2015

NAWT

National Association of Wastewater Technicians
Room 234-236

- 8 a.m. | Pre-Trip Inspections
- 9:30 a.m. | Hours of Service (HOS) Overview
- 11 a.m. | Roadside Inspections
- 1:30 p.m. | Environmental Impact Study: Effects of Water Softener on Septic Tank Performance
- 3 p.m. | A Study of Microbiological Induced Corrosion
- 4:30 p.m. | Ask the Expert Q & A

WJTA-IMCA

Water Jet Technology Association
Industrial Municipal Cleaning Association
Room 140-142

- 8 a.m. | Hydroexcavation — Tools to Stay Current in a Changing Marketplace
- 9:30 a.m. | Maximizing Productivity on Vacuum/Air Mover Projects
- 11 a.m. | Waterblast Safety Can Enhance Productivity, Quality and Profits!

SSCSC

Southern Section Collection Systems Committee
Room 231-233

- 8 a.m. | Combination Vacuum Unit Operation Overview
- 9:30 a.m. | Been There, Done That, Got The T-Shirt (Small Business From a Hands-on Perspective)
- 11 a.m. | So You Think You Are the Best? CCTV Inspection In Its Highest Form
- 1:30 p.m. | Avoid the Pitfalls — Trenchless Pipeline Repair and Renewal
- 3 p.m. | NOZZLES, NOZZLES, NOZZLES!
- 4:30 p.m. | Ask the Experts Q & A

SSPMA

Sump and Sewage Pump Manufacturers Association
Room 243-245

- 1:30 p.m. | Sizing Guidelines for New or Replacement Sewage Pumps
- 3 p.m. | Backup Battery and Combination Pump Systems Evaluation and Installation
- 4:30 p.m. | Specifying Pumps: Why Do Pumps Fail?

NASSCO

National Association of Sewer Service Companies
Room 130-132

- 8 a.m. | Overview of Manhole Rehabilitation Technologies
- 9:30 a.m. | When, Why and How to Defeat Infiltration Cost Effectively
- 11 a.m. | New Opportunities in Small-Pipe Relining and Reinstatement
- 1:30 p.m. | Pipeline cleaning Best Practices
- 3 p.m. | Large-Diameter Pipe and Drain Rehabilitation Technologies
- 4:30 p.m. | Ask the Experts Q & A

NEHA

National Environmental Health Association
Room 237-239

- 8 a.m. | New Technologies for Non-Potable Water Use
- 9:30 a.m. | Rules & Regulations with New Technologies and Working with Regulators
- 11 a.m. | New Technologies for Non-Potable Water Use Part 2
- 1:30 p.m. | OSHA Regulations and Smart Business
- 3 p.m. | Sales & Marketing with New Technologies
- 4:30 p.m. | Ask the Experts Q & A

NOWRA

National Onsite Wastewater Recycling Association
Room 240-242

- 8 a.m. | Lobbying
- 9:30 a.m. | Field Inspections Part One
- 11 a.m. | Field Inspections Part Two
- 1:30 p.m. | Septic Tank Safety — Lethal Lids
- 3 p.m. | Time Dosing
- 4:30 p.m. | Ask the Experts Q & A

Portable Restroom Track

Beverly Lewis
Room 243-245

- 8 a.m. | Mastering the Busy Season
- 9:30 a.m. | A Great Customer Experience
- 11 a.m. | Employee Retention and Recruitment

Business Track

Kelly Newcomb, Ellen Rohr, Women's Roundtable
Room 136-138

- 8 a.m. | Grow or Go! Why Most Companies Fail to Grow Effectively and What You Can Do to Keep Your Company From Failing
- 9:30 a.m. | Target Marketing: How to Effectively and Efficiently Grow Your Sales
- 11 a.m. | Effective Branding and How it Can Help Your Business
- 1:30 p.m. | Business Basics 101
- 3 p.m. | Build the Business You REALLY Want
- 4:30 p.m. | Women in Wastewater Roundtable Discussion

Gil Longwell
Room 140-142

- 1:30 p.m. | Protecting Private Enterprise

Marketing Track

Susan Chin
Room 133-135

- 8 a.m. | Ladies and Gentleman: Create Your Personal Brand and Strategic Network for Success in 5 Easy Steps
- 9:30 a.m. | Effective Website Design and Engaging Customers in the Digital Age
- 11 a.m. | Tapping into the Power of Social Media and Content Marketing

Road Rules & Safety Track

John Conley
Room 133-135

- 1:30 p.m. | A Trucker's Guide to Washington Speak
- 3 p.m. | Cargo Tank Safety and Regulatory Report
- 4:30 p.m. | Compliance with Part 180 and Preparing for a Tank Truck CT Shop Audit

You can view the complete schedule of events along with an exhibitor list, floor plan, travel information and everything else you'll need to plan your trip to Indy at wwett.com



Tuesday Sessions

Detailed session information available at: wwett.com

February 24, 2015

NAWT Track

Room 234-236

- 8 a.m. Septage Processing Introduction:
Working with an Engineer
- 9:30 a.m. Analyzing Your Resources:
What Goes on Around You is Important!
- 11 a.m. Introduction to Odor Control

Onsite Installer Track

Room 231-233

- 8 a.m. Soils, Design, O&M: What Every Installer
Should Know
- 9:30 a.m. Best Installation Practices for
Trouble-Free Pump Controls
- 11 a.m. Introduction to Effluent Filters

*MSW Track

Room 237-239

- 8 a.m. Mapping Solutions for Repair and
Maintenance of Water Distribution Systems
- 9:30 a.m. The Shift from Reactive to Proactive
Wastewater Management Best Practices
- 11 a.m. Why Hasn't Your Sewer System Evaluation
Survey Testing Worked?

*MSW - Municipal Sewer & Water

Treatment Plant Operator Track

Room 240-242

- 8 a.m. An Emerging Technology for Lagoon-Based
Nutrient Removal
- 9:30 a.m. The New Wastewater: Collection System
Challenges Caused by Today's Modern Trash
- 11 a.m. Wastewater Microbiology

Industry Safety Track

Room 243-245

- 8 a.m. New Trends and Technology in Equipment
for Excavation Safety
- 9:30 a.m. Best Practices: Use, Care and Repair of
High-Pressure Sewer Cleaning Hose
- 11 a.m. Development and Execution of a Cross-Bore
Prevention Program

Business Track

Room 130-132

- 8 a.m. How to Position Your Company in the Market Today
- 9:30 a.m. Six Proven Tactics to Generate Leads and
Turn Them Into Revenue
- 11 a.m. Growth by Acquisition or Exiting Gracefully:
Buying or Selling a Septic or Sewer Business

Drain Cleaning Track

Room 133-135

- 8 a.m. Drain Cleaning Methods - Then and Now
- 9:30 a.m. The Physics of Pipe Cleaning Tools and
How I Make it Work for Me
- 11 a.m. Lateral Lining - Are You Using the Right Tool?

Industry Technology Track

Room 136-138

- 8 a.m. How to Manage Septic Systems
using Remote Monitoring
- 9:30 a.m. GPS Tracking: Hype Vs. Reality
- 11 a.m. Wireless Controls in the Waterjet Industry:
Sacrificing Safety for Convenience

Septic Series Track

Room 140-142

- 8 a.m. True Crime Scene Stories: How to Inspect
and Troubleshoot Suspect Onsite Systems
- 9:30 a.m. One Man's Waste is Another Man's Treasure
- 11 a.m. Dewatering Options for Roll-Off Containers



*Complete contest rules and details at: wwett.com/rules



Wednesday Sessions

Detailed session information available at: wwett.com

February 25, 2015

Septic Series Track

Room 140-142

- 8 a.m. Considerations in Building Your Next Vacuum Truck
- 9:30 a.m. Grease Collection and Treatment:
Raising the Bar Via Resource Recovery
- 11 a.m. Analyzing Common Onsite Septic System
Malfunctions and Options for Prevention & Correction

*MSW Case Study Track

Room 231-233

- 8 a.m. Retrofit of the Lansdowne Sanitary P/S
- 9:30 a.m. Huntington Beach Successfully Navigates
Emergency Repair of Fragile Storm Drain
Collection System Rehabilitation –
Alternative Technology
- 11 a.m. Collection System Rehabilitation –
Alternative Technology

*MSW Technology Track

Room 237-239

- 8 a.m. Implementation of Acoustic Inspection Technology
at the City of Augusta
- 9:30 a.m. Highlights from the 7th Edition of Operation
and Maintenance of Wastewater Collection
Systems Manual
- 11 a.m. Technological Advancements Fulfill the
Promise of Zoom Survey Paradigm

*MSW - Municipal Sewer & Water

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Portable Sanitation Track

Room 136-138

- 8 a.m. Portable Sanitation - Special Events
- 9:30 a.m. Making Your Portable Restroom Business Lean
and Mean – How to Boost Productivity and
Increase Your Bottom Line
- 11 a.m. Building and Coaching Your Portable Sanitation Team

Treatment Plant Operator Track

Room 240-242

- 8 a.m. Utility Regulation Basics for Grease Haulers
- 9:30 a.m. The Waste in Our Wastewater
- 11 a.m. Security Issues and Best Practices for Water/
Wastewater Facilities

Pipe Rehab Track

Room 243-245

- 8 a.m. Integrating Temperature Sensor Technology
within Lateral Pipeline CIPP Installations
- 9:30 a.m. CIPP Calibration and Vacuuming
- 11 a.m. Extending Life Expectancies with Corrosion-
Resistant Coatings and Linings

Business Track

Room 133-135

- 8 a.m. Team Building for Profit
- 9:30 a.m. Ten Commonsense Ways to Grow and
Improve Your Business
- 11 a.m. Setting Expectations – The Key to Sales
and Customer Satisfaction

Advanced Onsite Installer Course

Room 234-236

8 a.m. - 5 p.m.

- Introduction and Site Evaluation
- System Sizing and Basic Design Principles
- Pumping to Systems
- Installations of ATUs
- Installing for Management
- Troubleshooting Systems

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WELL-MANAGED ASSETS

Texas utility's award-winning collection system is backed by a 'digital warehouse of data'

By Erik Gunn

The sewer system serving the City of Denton, Texas, has been growing with the city and has experienced plenty of growing pains.

But over the last few years, Denton's sewer utility has been getting a handle on some of those growing pains.

Sophisticated software and attentive deployment of manpower get the credit. So does a culture that values and encourages employee participation. And Texas has taken notice. In April 2014, the Water Environment

Association of Texas gave Denton its annual Sidney L. Allison Award recognizing the utility's asset management program for how it's improved productivity and service for the Denton Wastewater Collection System and its customers.

The operation has come a long way. Denton's total population is just 124,000, but the area served by the city's sewer utility "is pretty substantial" beyond the city limits, says P. S. Arora, assistant wastewater director for Denton, a suburb of Dallas-Fort Worth. Altogether, it

takes in wastewater from a territory of 158 square miles.

The city also has wholesale agreements to provide sewer service to smaller cities around Denton.

"The sewer system is pretty spread out," Arora says, with lift stations scattered throughout the network. The large footprint makes keeping up on malfunctions something of a challenge. "Our dollars are limited and our manpower is limited."

So Denton has turned to asset management, trying to systematically understand the needs, conditions and urgency for repairs to all parts of the sewer network.

Starting out

The city already had what would become the backbone of its asset management system. In the mid-1990s, Denton acquired an Esri GIS mapping system and mapped the entire sewer and water systems.

In the late 1990s, the city installed a computerized maintenance management system from Azteca Systems, which has since been upgraded to the company's current Cityworks system.

"All of the work done by our crews, whether it is CCTV work, smoke testing, line flushing, point repair, fixing a line, root cutting, applying chemicals—it doesn't matter what they do, everything goes through the computerized maintenance management system," Arora says.

This CMMS work-order system has helped build a database of the system as time goes on, he explains. "We have lots of data now for the maintenance side of the collection system."

Denton also uses InfoWorks

(Innovyze) for sewer system capacity evaluation and master planning of the system.

All this technology has brought Denton "a very nice maintenance-and capacity-management system," Arora says. "But we didn't have a full asset-management program."

A crisis situation helped change that.

Growth and challenge

Denton's growth required the city to begin replacing existing sewer pipe with larger-diameter lines. In 1998, officials began developing a master plan to identify pipe requirements for adequate capacity in response to increased demand.

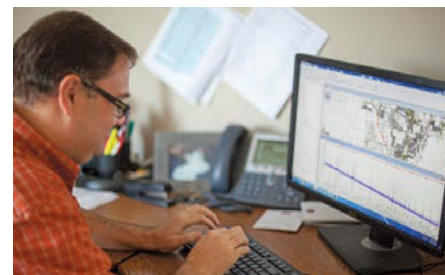
But about eight years ago, a developer walked away from a major project that had led Denton to budget for a new wastewater treatment plant and install 6 miles of new, larger sewer line to the new facility. The bonds for the plant had been sold, but the new customer base that was anticipated with the development was suddenly pulled out from under the city.

"We got in a fiscal straitjacket," says Arora, who eventually came across the Sewer Cataloging, Retrieval and Prioritization System – SCRAPS for short. Produced by the Water Environment Research Foundation, SCRAPS enables wastewater utilities "to focus their inspection program in areas most likely to need attention."

(continued)



Dario Garibay uses an inspection camera to photograph a placard held by David Brown. The placard identifies where in the nearly 500 miles of sewer line the photos were taken. Right: James Wilder P.E., senior engineer, reviews asset management data. (Photography by Jimmy Alford)



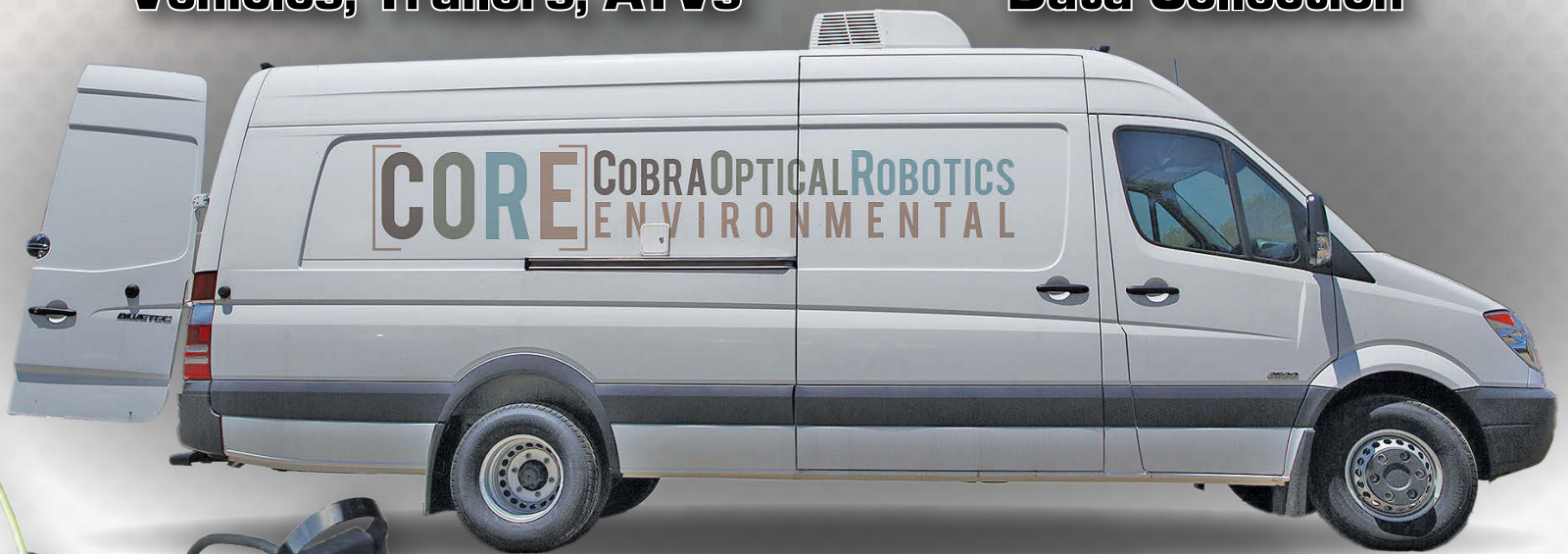
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Clockwise from above: Victor Moore lowers an inspection camera into a manhole; Ronald Linn Jr., GIS engineering technician III, points out an asset location to Rafael Hernandez, engineering technician IV; Keith Echols preps for flushing wastewater lines; Keith Echols, Dario Garibay and David Brown place a high definition camera into a manhole. The camera takes still images used to determine if the pipe needs to be inspected further and possibly replaced; Casey Bowles stands at the exit pit during a pipe bursting job.

The city retained the engineering consulting firm Burns & McDonnell, which had been involved in developing SCRAPS, to implement the model in 2008.

Setting priorities



PROFILE: Denton (Texas) Wastewater Collection System

POPULATION SERVED:
124,000

SERVICE AREA:
City of Denton, Texas, and surrounding communities

**TREATMENT CAPACITY/
AVERAGE VOLUME:**
21 mgd/15.2 mgd average flow

INFRASTRUCTURE:
500 miles sewer mains,
27 lift stations

WEBSITE:
www.cityofdenton.com/departments-services/departments-q-z/water-utilities/wastewater/wastewater-collection

The task began with putting in more than 80 data points for every sewer line in the system. “The best part of going through that process is you learn what you don’t know about your system,” says Arora.

Each line was then graded on a scale from 1 to 100 for the priority of correcting problems that could lead to failure: The higher the number, the higher the priority. After completing those ratings in 2009, Denton followed up by using the information to organize its sewer line cleaning program into one-, five- and 10-year cleaning cycles.

For example, recently installed PVC lines in a new subdivision would not be expected to fail anytime soon; those sort of lines were put on a 10-year cleaning and inspection program. Smaller lines in older parts of the community might be put on a five-year schedule. Lines deemed to be at the greatest risk, as well as lines serving high-volume sources like restaurants or apartment complexes, are scheduled to be checked annually.

In ranking the lines by priority, Denton didn’t just rely on its consultant’s recommendations though. Instead, Arora and his management

team ran the recommendations by the most experienced employees in the sewer department.

“We made sure the results coming out of the program were matching up with the judgment of the guys who have been here 20, 25, 30 years,” Arora says. “This allowed great buy-in. The best part was the involvement of the operations guys, who also came up with the need for the one-year cleaning cycle.”

Since those initial priorities were set, experience has led to adjustments. Some lines originally considered at high risk for failing have proved to be more durable, for instance, so they’ve been moved to a less frequent cleaning and inspection cycle.

Ongoing inspection

Denton also changed its approach to CCTV inspection, again based on the priority rankings. The city bought an Envirosight Rover 125 camera and tractor in 2007. At the time, though, its use of CCTV was “mainly in reaction to problems,” says David Brown, an engineering technician who now heads up a two-man daily inspection crew. Starting in 2011, Brown and an associate began a program of conduct-

ing routine inspections every day. By 2013, Brown’s team was inspecting 200,000 feet of wastewater line per year – about 1,000 feet per day.

Some of those inspections were ordered for immediate concerns, mostly roots choking off lines, but increasingly they’re being built into a routine process based on the priority ratings. Even if called out to an urgent problem, Brown makes it a point to check if there are lines in the vicinity that are high on the priority list for inspection and to include them in the day’s work if possible.

Along the way, if they encounter problems that need a quick fix – flushing out a clogged pipe or removing roots, for example – they can arrange for immediate follow-up by one of Denton’s flushing trucks. The program’s high productivity has enabled Arora to persuade city officials to expand personnel and equipment, such as recently acquiring the city’s fifth flushing truck in its fleet.

The inspection program also allows Brown and his associate technician to make more mundane improvements, such as correcting the GIS database when the address for a

(continued)



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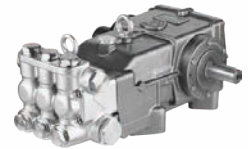
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CUTTING OUT GREASE

Denton, Texas, has enjoyed remarkable success from implementing software-based solutions to asset management and sewer maintenance.

That even extends to ridding the lines of grease that can clog them as badly as plaque in the arteries of a cardiac patient.

"We have a very effective grease trap inspection program in place," says P. S. Arora, assistant wastewater director. "Most cities don't realize how bad grease is for the sewer system."

It wasn't always that way.

Rain in Denton ranges from 25 to 40 inches a year, with the normal rainfall being about 35 inches, Arora says. Yet Denton's sewers overflowed – even in dry weather conditions.

"All that was because of grease," says Arora. "It was drying up like a cake in the sewer lines."

State regulations require the city to report its overflows to the Texas Commission on Environmental Quality. Denton officials knew they had to do something.

The city expanded its fleet of flushing trucks from two to four (a fifth one is on order) and ramped up its flushing of sewer lines. The city also hired a full-time inspector to look at the local restaurant industry's grease traps. "There are over 600 grease traps in the city," Arora says.

Denton acquired database software specifically designed to track grease trap problems. The application keeps track of all grease trap owners in the city, including when their traps were last certified by the city, when they were pumped out and where the waste grease was disposed, and any citations they have received for violating the city's grease trap ordinance.

"We've had an 80 percent reduction in the number of overflows from 2001," Arora says – from 62 overflows, totaling 46 million gallons, in 2001, to 13 overflows in 2013 totaling a mere 7,050 gallons.

line location is listed incorrectly or the composition of a line is erroneous – clay instead of PVC, for instance.

"We're basically doing several things at one time," says Brown. "We're inspecting the line, looking for problems, inspecting the GIS mapping system – and doing man-hole inspections."

Even if a problem can't be fixed immediately, it can be marked. "Then when the field crew comes out, they can fix it without having to look for it," he says.

Camera versatility

Denton relies heavily on the Envirosight RC90 pan/tilt/zoom camera for routine inspections. To minimize downtime, the city acquired a second RC90 so they can keep working if one is damaged.

When both are in use, one is set up for 6-inch pipe and the other for 8-inch or larger pipe. That saves time by eliminating the need to make adjustments for different line sizes, Brown points out.

More recently, Denton began using Envirosight's Jetscan unit, which combines jetting and inspection in a single tool. "Basically, the camera work has gone from being reactive to being proactive," Brown says.

Denton's latest step was imple-

P. S. Arora, P.E., assistant director of wastewater (left) with Allison Carlwicz, administrative assistant III, and Justin Diviney, manager of wastewater collection.



Denton Wastewater Department hydrovac operators (from left) Grant Leach, field services worker II; Chad Sconce, field services worker III; Frankie Nickels, field services worker II; Gerald Norton, field services worker III; James Boliver, field services worker II; Gary Wheeler Jr., field services worker II; Dario Garibay, field services worker II, and Keith Echols, field services worker II.

menting CapPlan software, now upgraded to InfoMaster Sewer, from Innovyze. It was chosen, Arora says, because it's "a complete infrastructure support and asset management and planning tool for sewer systems."

Continued refinement

The CapPlan database integrates the GIS maps with data from Cityworks and the priority rankings from SCRAPS. It employs CCTV video from inspections as well. The CCTV database is matched to the scoring system employed under the Pipeline Assessment Certification Program established by the National Association of Sewer Service Companies.

The priority scores generated for each segment of the system are entered into InfoMaster, and the software identifies repair projects, evaluates their necessity, runs calculations for full replacement costs of the defective asset compared with the rehab cost and even recommends a particular method for rehab.

"When we run it, we can create a beautiful map from the InfoWorks model results," Arora says. "It will give us a priority ranking for all the CCTV work to be done."

Denton's asset management program has grown so robust it even includes trees. At the University of North Texas, located in the city, researchers have mapped Denton's tree canopy using satellite imagery. Where the canopy is especially dense, corresponding sewer lines are targeted for a closer look for possible root damage.

That type of creative, out-of-the-box thinking is made possible by the

immense depth of information already at the city's disposal. "What you have is a digital warehouse of data for the entire system," Arora says. "You find a lot of different ways to make things better."

All these investments in technology, equipment and people have paid off. Arora says Denton has cut wet-weather overflow volume by 99.5 percent, and instances of choked sewer mains – whether from roots, clogs or other problems – have fallen by as much as 94 percent, he says.

"We have come a long way from where we were in 2000," he says.

Arora has already calculated the likely savings the city will experience from shifting to prioritized asset management and away from standard 50-year depreciation: some \$20 million over 10 years.

And Denton has no plans to stop now. ♦

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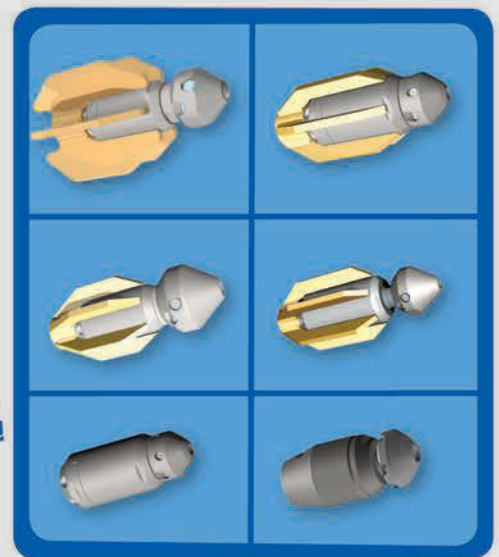
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EASY OPERATOR

Wireless functionality of the GapVax industrial HV-56 hydroexcavator puts control at your fingertips

By Craig Mandli



Mike Blair, right, an electrical design technician for GapVax, explains the features of the company's HV-56 Advanced Series hydroexcavator to an attendee at the 2014 show. The new truck features control units both in the cab and on the body for most critical functions. (Photo by Craig Mandli)

GapVax introduced its latest advancement with the tech-savvy hydroexcavation operator in mind. The company rolled out the HV-56 Advanced Series hydroexcavator at the 2014 Pumper & Cleaner Environmental Expo International in Indianapolis, complete with all the technological “bells and whistles” designed to provide both accuracy and efficiency.

“Our MC Advanced Series was such a big hit at the 2013 show, we knew we wanted to add this capability to all of our equipment,” says Mike Blair, GapVax’s lead electrical design technician. “Since our hydroexcavators are our most popular units, it only made sense to add the Advanced system to them.”

The unit’s boom, vacuum break, throttle and water pressure functions are wirelessly controlled with full-color displays that offer the operator visual monitoring of all operating functions. There is a control inside the cab, as well as one inside a weather-tight control box located on the outside of the unit. These display screens are designed around the operator and are unaffected by sunlight. Both wireless control units are 12-button CANbus switches.

“The system allows the operator to monitor all unit controls at all times,” says Blair. “It saves the operator time and efficiency, as they don’t have to walk around the truck to con-

trol the various systems any longer.”

The Advanced system has alarms and interlocks that allow for safe and efficient operation. Data logging and system diagnostics also provide access to system faults and hours of operation, giving the operator the ability to troubleshoot system failures.

“This system was made to appeal to companies with newer, younger, tech-savvy operators on their staff,” says Blair. “It eliminates a lot of the busy work functions of a typical hydroexcavator. It was something our customers wanted. Higher-tech equipment is the wave of the future.”

“This system was made to appeal to companies with newer, younger, tech-savvy operators on their staff. It eliminates a lot of the busy work functions of a typical hydroexcavator. It was something our customers wanted. Higher-tech equipment is the wave of the future.”

— Mike Blair

The system comes fitted for the popular HV-56 hydroexcavator, which features 5,000 cfm with vacuum of 28 inches Hg. It can handle a payload of 13.5 cubic yards with its heavy-duty 1/4-inch EXTEN Steel collector body. Single-mode filtration eliminates wet or dry change-over, and its full-opening door with field-adjustable hinge and dual cylinders adds to the safety and conve-

nience of the unit. Four fail-safe, individually adjustable locks ensure a tight tailgate seal. Its body and components are durably blasted to near white SP-10 specs. It has a positive displacement pump with ductile iron, closed-end impellers and an ultra-efficient air injection cooling system.

Standard features include field-adjustable baghouse doors, a stainless steel “sure seal” sealing surface on tailgate and dump chutes, full bearing body pivot pin, blower hour-meter and temperature gauge, a custom-engineered stainless steel

prop, and a stainless steel tube sheet that resists corrosion and simplifies bag replacement.

Options include an auger unloading system, sludge pump, body pressurization system, pneumatic vacuum relief system, remote pendant or radio-controlled vacuum relief valve and throttle, liquid load indicator, toolbox, 20-inch manway, hydraulic vibrator, washdown system, stainless steel body, grounding cable, additional work lights, check valve at the blower, high-rail system and manual-rotating telescopic boom.

“The HV-56 is a very popular model, and we’re optimistic that adding the Advanced control system to it will make it even more so,” says Blair. “We still get customers that prefer the ‘old school’ control systems, but more of them are changing over every year.”

Blair says GapVax tries to roll out one of its new products every year at the show. For the 2015 version, newly rebranded the Water & Wastewater Equipment, Treatment & Transport (WWETT) Show, that won’t change.

“This show is really the perfect crowd for us,” he says. “It’s the chance for everyone in the wastewater industry to gather in one place. Our biggest goal is to just keep improving our products and listening to our customers.” 888/442-7829; www.gapvax.com. ♦

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GAIN THE TECHNICAL EDGE

NASSCO's Technical Day agenda packed with innovative trends and technologies

By *Ted DeBoda, P.E.*

One of the best ways to improve your technical knowledge is just around the corner. During NASSCO's Annual Conference, scheduled for Feb. 11-13 in Savannah, Ga., NASSCO's Technical Day on Friday, Feb. 13 will provide an opportunity for NASSCO members to refresh their knowledge and learn what's new in the world of trenchless technology.

This year's event will be the most exciting one yet. The morning will kick off with two technical tracks, outlined below.

Safety, Risk Assessment and Municipal Issues

Construction Safety and Risk Assessment: A discussion on the importance of daily construction crew tailgate meetings including focusing on safety and hazard identification and technology risk assessment.

Health and Safety Academy: Review of the availability of online health and safety training programs for busy construction personnel.

Lessons Learned in Augusta, Ga.: Their successes and failures in sustaining their collection system.

Utility Infrastructure Challenges in the Urban Forest – Making a Difference Now: Social, economic and environmental health attributes related to utility maintenance in rights of way.

Resolving the Dilemma of Aging Sewer Laterals with a Private/Public Partnership: Aging and failing private sewer laterals are increasingly problematic for both the local homeowners and system owners. An innovative private/public partnership is a possible solution.

Collection System Inspection, Maintenance and Rehabilitation

New Developments in Side Scan Technology: A presentation of current advances in the side scan technology for pipeline condition documentation.

Sewer Line Cleaning Techniques – Cleaning Nozzles, Approach & Best Practice: Discussion of different noz-

zles and when and where they are best applied.

Manhole Technologies, Inspection and Testing: A presentation on a variety of topics including composite manhole adjusting rings, grates and corresponding frames as a replacement for cast iron, and manhole rehab testing and inspection.

Integrated Heat Sensor Technology within Medium to Large Diameter CIPP Installations: Pros, cons and lessons learned in continuous temperature monitoring from a contractor's perspective. Discussion of knowledge gained in the field and successes as well as challenges that led to modifications in both the product and techniques to use the product.

The Shift from Reactive to Proactive Wastewater Management Best Practices: Brief abstract on GIS and cloud-based software solutions using today's proven Internet and networking technology to make wastewater data searchable, visible and action-

able in ways never before possible, without capital expense.

The technical track sessions, which are designed to include time for a member question-and-answer period, will be followed with a keynote speech by Rod Lovett, chief of Wastewater Collection and Transmission, Miami-Dade County, Fla. He will discuss one of the country's largest consent decrees and how issues are being addressed, as well as successes in using trenchless technology to reduce flow to three major treatment plants.

The morning will conclude with a forum composed of a panel of municipal representatives who will discuss their key issues as they relate to collection system rehabilitation including mainlines, laterals and manholes.

NASSCO's Annual Conference and Technical Day are open to NASSCO members. If you are not yet a NASSCO member or want to sign up for the 2015 Annual Conference, please visit www.nassco.org. ♦

NASSCO (National Association of Sewer Service Companies) is located at 2470 Longstone Lane, Suite M, Marriottsville, MD 21104; 410/442-7473; www.nassco.org

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December 8-9, 2014

Fort Wayne, IN

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Trainer: Tim Back

For more information contact Tim Back at 513-253-8461 or tback@cinci.rr.com

December 18-19, 2014

Las Vegas, NV

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Trainer: Rocky Capehart

For more information contact Rocky Capehart at 916-834-2712 or rcapehart@sprayroq.com

January 6-7, 2015

Phoenix, AZ

Cured In Place Pipe

8:00 am – 5:00 pm Day 1 • 8:00 am – 1:00 pm Day 2

Trainer: Gerry Muenchmeyer

For more information contact Gerry Muenchmeyer at 252-626-9930 or gerry@muenchmeyerassoc.com

January 22-23, 2015

Seattle, WA

Manhole Rehabilitation

8:00 am – 5:00 pm Daily

Trainer: Rocky Capehart

For more information contact Rocky Capehart at 916-834-2712 or rcapehart@sprayroq.com

February 25-26, 2015

Indianapolis, IN

Cured In Place Pipe

8:00 am – 5:00 pm Day 1 • 8:00 am – 1:00 pm Day 2

Trainer: Gerry Muenchmeyer

For more information contact Gerry Muenchmeyer at 252-626-9930 or gerry@muenchmeyerassoc.com

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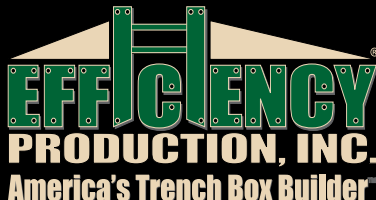


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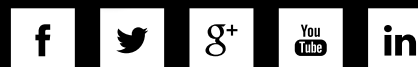
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Design and Manufacture of Video Pipeline Inspection Systems

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CLEANING AND MAINTENANCE

By Craig Mandli

Truck/Trailer/Portable Jetters

Van kit jetter

Van kits from **American Jetter** come with Kohler engines from 27 to 74 hp, flows to 40 gpm and pressures to 5,000 psi. They have a compact frame incorporating a speed-controlled hose reel above the engine and the fuel tank behind the reel. The water tank is mounted on a separate frame and is plumbed for multiple configurations. This leaves installation flexibility and space for storage and other tools. Low-water shut-off prevents pump damage in low-flow situations. The powered hose reel can carry up to 500 feet of 1/2-inch hose, or 600 feet of 3/8-inch hose. Pressure adjustment and pulse features are easily accessible from the front of the jetter. **866/944-3569; www.americanjetter.com.**

Skid-mounted jetter

The **RCJ Series** skid-mounted jetter from **Cam Spray** is offered in flows and pressures of 8 gpm at 3,500 psi and 7 gpm at 4,000 psi. It features a three-plunger industrial pump with pulse feature powered by a 688 cc Honda engine. It comes with 200 feet of jetter hose that can also be used to supply an optional portable reel cart available with 200 or 300 feet of jet hose. It is equipped with a 35-gallon buffer water tank with float control, powder-coated heavy tube frame, washdown gun and four-nozzle set. It easily mounts in the side door of a cargo van, on a truck bed or inside a service truck. **800/648-5011; www.camspray.com.**

Water jet cleaning gun kit

The **79WGD** water jet cleaning gun kit from **Guardair Corporation** delivers a turbulent, high-velocity air/water stream for tough cleaning jobs. It has a precision air-volume control and water shut-off valve. Users can choose air/water for cleaning, water only for rinse or air only for drying. The coupler allows for multiple syphon options. An 18-inch stainless

The methods for cleaning and maintaining municipal sewer lines are diverse, which means professionals need to have a varied toolbox of equipment. These jettters, cable machines, nozzles, waterblasters, combination units, inspection cameras and equipment, and industrial vacuum loaders assist in cleaning debris, roots and grease, removing paint and other coatings from surfaces, hydroexcavation and cutting. Here is a look at some of these important tools:

steel extension adds ease for spraying hard-to-reach locations. The ergonomic Classic+ pistol-grip-style handle provides user comfort. It has a durable cast aluminum body, hanging hook, aluminum safety nozzle tip, 6-foot feed tube with brass sinker and a 3/4-inch garden hose adapter. It meets OSHA standards. **800/482-7324; www.guardaircorp.com.**

Truck-mounted hydrojetter

The **O'Brien 7000-T** hydrojetter from **Hi-Vac Corporation** includes all of the features of the O'Brien 7000 Series trailer jetter but is designed for truck-mounted applications. It has flow ranges of 18 to 65 gpm and pressure capabilities of 2,000 to 4,000 psi. **800/638-1901; www.obrienmfg.com.**

Sewer jetter

The **Vermeer J12-30** sewer jetting system, distributed by **McLaughlin Group**, turns a vacuum excavator into a versatile jetter/vac combination unit for cleaning manholes and small sewer lines up to 12 inches in diameter and hydroexcavation in sewer lateral repairs or spotting utilities. The jetter hose is inserted into the line and uses the pressure from the vac to propel the jetter head farther down the pipe. As the jetter hose flushes out the line, the vac's suction hose removes the debris. Once the cleaning is complete, the hose is simply retracted. The option is available for Vermeer V500HD, V800HD and V1200HD vacuum excavators. The system includes 500 feet of hose, two 205-gallon tanks and a tethered remote. **800/435-9340; www.mclaughlinunderground.com.**

Hot-water cleaning package

The **Cold Weather/Hot Cleaning Package** from **MyTana Mfg. Company** includes the Max Blast MY30 gas jetter and the portable Hot Box high-pressure hot-water heater. Together, these units deliver 4 1/2 gpm, 3,000 psi water heated to 180 degrees F. The package includes a washer wand with four different nozzles for cleaning, ramp, tool bucket,



antifreeze kit and high-temperature hose setup. It can be used for dissolving grease in food applications, melting iced-up septic tanks and frozen lines in cold climates, and cleaning equipment, siding and parking lots. **800/328-8170; www.mytana.com.**

Portable water jetter

7 The **Model KJ-3100** portable water jetter from **RIDGID** offers 3,000 psi actual working pressure to handle large commercial and industrial applications. It propels a highly flexible and lightweight hose through 2- to 10-inch lines, providing increased flexibility without reducing any of the strength. The hose blasts through sludge, soap, grease and sediment blockages, power scrubbing the line to flush debris away and restore drain-lines to full, free-flowing capacity without the use of harmful chemicals. Its removable hose reel makes it unnecessary to purchase portable reels. The reel can be completely removed to ease loading, and the two-wheeled cart, which was designed to fit through standard doorways, easily negotiates tight turns. The pulse action can be activated to effortlessly navigate difficult bends and traps. **800/769-7743; www.ridgid.com.**

Truck-mounted sewer jetter

8 The truck-mounted **Ramjet** from **Vector Manufacturing** uses a Jet Rodder water pump to break up blockages and flush out debris in sanitary lines. Armed with up to 2,500 gallons of water in a stainless steel tank, it delivers flows of 60 to 100 gpm at 2,000 or 2,500 psi. The water pump is a single-piston, hydraulically driven, dual-acting pump that delivers a jackhammer action water flow, breaking through line blockages and scouring even the toughest caked-on debris from pipe walls. It can be configured with either a front- or rear-mounted hose reel. The auto wind hose guide allows hands-free operation from the control panel for a clean, tight wrap. **800/627-3171; www.vector.com.**

Cable Machines

Mainline drain cleaning machine

9 The **TorqueMaster TM750** mainline drain cleaning machine from **Coast Manufacturing** has a double-welded, powder-coated tubular steel frame and an easy-start 3/4 hp dual-capacitor motor. The main shaft drive is fabricated from stress-proof steel, with sealed ball bearings on the shaft and drive arm bearings that don't need lubrication. It has a straightforward pulley drive system, 10-inch-diameter solid polyurethane tires, extra-wide rear handle for stability in the upright position, and quick and easy one-man reel changeover. **800/541-7015; www.coastmanufacturing.com.**

Drain and sewer-cleaning machine

10 The **Model D-5** continuous cable drum machine from **Electric Eel Mfg.** cleans 3- to 10-inch lines up to 100 feet. The high-density polyethylene drum and belt guard will not rust or dent and holds up to 100 feet of 3/4-inch Tri-Max cable. Three sealed heavy-duty ball bearings support the drum and thick wall guide tube for extended wear. It is powered by a heavy-duty 1/2 hp capacitor-type motor. It has solid 10-inch wheels for easy maneuvering and stabilization while in operation, extra-strength 1 1/4-inch steel tubing framework, five-position height adjustment on handle, a wheel brake, continuous belt skids and loading wheel built into the handle, GFCI on a 20-foot line cord and an air-operated foot switch. **800/833-1212; www.electriceel.com.**

Heavy-duty electric drain cleaning machine

11 The **Model GO 68HD** heavy-duty electric drain cleaning machine from **Gorlitz Sewer & Drain** is available in two different versions, either with an open steel reel or enclosed polyethylene drum, and can be outfitted with an optional power feeder. The standard configuration includes 150 feet of 1 1/16-inch hollow-core cable that should reach most blockages with a single reel. The machine weighs 185 pounds, and adding a loading ramp and electric winch to any vehicle makes transportation quick and simple. It is designed to clean pipes from 3 to 8 inches in diameter. **562/944-3060; www.gorlitz.com.**

NOZZLES

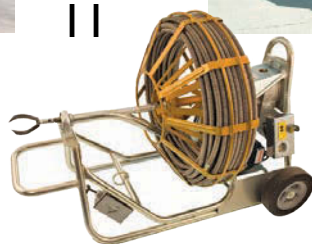
Low-maintenance cutting nozzle

12 **Root Rat** cutting nozzles from **Chempure Products** are used with jetters from 11 hp to large truck-mounted models. Manufactured of hardened stainless steel, they come with a toolbox with two interchangeable rotors – one with cables and the other with chains. The combination kit includes extra chain, cable and bearings. They need no repair or rebuilding other than bearing replacement, which can be completed in less than two minutes with minimal parts. **800/288-7873; www.chempure.com.**

Water jet nozzle

13 The **RPN4009** self-rotating water jet nozzle from **NLB Corp.** cleans pipes and tubes at pressures up to 40,000 psi. Designed for a minimum pipe diameter of 3/4 inches, it is the first nozzle in the Typhoon 10 series to operate at ultra-high pressure. It is precision machined and coated with titanium nitride for long life. It can be ordered with cutting/cleaning or polishing heads. At 4 3/4 inches long, it works at a maximum

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flow of 9 gpm and rotates at 7,000 rpm. **248/624-5555; www.nlbcorp.com.**

Sewer nozzle

14 The **Hammerhead** sewer nozzle from **NozzTeq** is a NASSCO Tier III nozzle with internal conduits and spray angles designed to produce efficient, maximally powerful jetting streams at the nozzle end using relatively low truck-supplied water pressures. Crews can clean more pipe with fewer passes, while generating less wear and tear on trucks and using less fuel. The water conduits preserve laminar water flows from the truck to the final jet stream, so water pressure is never compromised by turbulence. The tightly focused jet streams are deployed at precisely calculated angles that move out debris efficiently. It is made of low-carbon stainless steel with styrene butadiene rubber covers that protect the conduits and jets. The jets can be switched as needed to accommodate water flows from 5 to 50 gpm. **866/620-5915; www.nozzteq.com.**

Rotary sewer nozzle

15 The **Warthog WGR Magnum** high-performance rotary sewer nozzle from **StoneAge** has speed control and seal technology for improved tool life, reduced maintenance and better operation in harsh environments. It effectively handles recycled water, retaining jet quality under poor water conditions, and its streamlined design allows for better forward and reverse movement through pipe. Hardened steel centralizer fins can be replaced individually as wear occurs, further protecting the tool for longer operation in the field. **866/795-1586; www.sewernozzles.com.**

Stainless steel cleaning nozzle

16 The one-piece **FJ Penetrator** stainless steel cleaning nozzle from **USB - Sewer Equipment Corporation** is neither bonded nor screwed together, enhancing strength and reducing chances of failure under pressure. Its 3-D Hydro Mechanics, located in the lower part of the chamber, eliminate pressure in the upper portion of the nozzle and prevent explosion. The water coming from a pressurized hose is immediately guided directly into channels and smoothly into a one-piece ceramic nozzle insert, which does not require winglets or flow-straighteners because of the hydro-mechanics in and out of the chamber. It is ideal to remove sand, mud, silt, grease and obstructions from sewer and stormwater lines. **866/408-2814; www.usbsec.com.**

Tank cleaning head

17 **TankMaster** 3-D tank cleaning heads from **Woma Corporation** have an impact protection cage, work with operating pressures up to 21,750 psi and with water flow rates of 52 to 158 gpm. An easily

adjustable braking system allows the operator full rotation speed control for optimized cleaning performance. Hardened gears combined with a slip clutch increase the unit's life span. All models are available with a variety of rotors and arm extensions, allowing a range of container sizes that can be cleaned. **800/258-5530; www.womacorp.com.**

WATERBLASTING

Centering device

18 Manufactured from an aerospace elastomer, the flexible **Cnt-r-Kut** centering device from **Arthur Products** conforms to damaged or deformed lines, and can be easily trimmed in the field to fit virtually any line from 2 to 8 inches in diameter. Simply attach a 3/8- or 1/2-inch NPT hose to one end and a 3/8- or 1/2-inch NPT nozzle to the other end. **800/322-0510; www.arthurproducts.com.**

Heavy-duty degreaser concentrate

19 **COBRA Heavy Duty Degreaser** concentrate from **Enviroform Industries** provides high-strength cleaning for tough cleanups. Dirt, grease, grime and other soils are powered away quickly. It works on almost any industrial surface, including steel, iron, aluminum, plastics, magnesium, glass, composites, epoxies and concrete, cleaning at up to a 128:1 dilution. It is easy to use by hand, as a parts dip or for pressure washing. It is made with green ingredients approved by the EPA's Design for the Environment program. It biodegrades within 30 days, is nonflammable and has low VOC that meets the AQMD minimum VOC level of 25 grams per liter undiluted. **877/694-6330; www.enviroformindustries.com.**

High-pressure hose rotating system

20 The **Pipemaster** high-pressure hose rotating system from **Hammelmann Corp.** is used to remove both soft and very hard deposits from the insides of pipes and pipelines, including those with bends and vertical sections. The slow rotation speed results in increased cleaning/removal rates. Powered deployment and retraction can remove pipe blockages. A high-pressure supply hose line is fixed between the pump and the rotary joint on the hose-rotating unit. A second hose is connected to the rotary joint and runs via the deployment unit into a protective hose to the positioning device at the work piece. The rotating unit is driven by compressed air at 60 psi and comprises a pneumatic motor with gearbox, a pneumatic maintenance unit, the high-pressure rotary joint and a pneumatic control system all mounted on a three-wheel trolley. **800/783-4935; www.hammelmann.com.**



Mobile waterblasting unit

21 The **X-Series** mobile waterblasting unit from **Jetstream of Houston** has a greaseless spread-bearing PTO that provides reliable power transmission and reduced maintenance time. Its integrated filter and water tank system extends component life and increases operating time, while a strong, lightweight frame provides better towing performance. It is built around the UNx fluid end system designed for fast conversion between 5,000 and 40,000 psi operating pressures. **800/231-8192; www.waterblast.com.**

JET/VAC COMBINATION TRUCKS/TRAILERS

Wireless-controlled combination jet/vac

22 The **MC Advanced Series** combination jet/vac from **GapVax** includes a monitoring system allowing the operator to observe and troubleshoot the entire system. Two display screens control most functions, while providing manual control should something go wrong electrically. All body, boom and hose reel functions, vacuum break, throttle and lighting are wirelessly controlled, still maintaining proportional boom and hose reel control. Specs include 3/16-inch ASTM A572 Grade 50 Exten steel, 5- to 12-cubic-yard debris body and stainless steel water tank with capacity up to 2,000 gallons. Vacuum pump options range from 3,500 to 5,000 cfm, with up to 27 inches Hg. The boom is an 8-foot, front-mounted telescopic design with dual lift cylinders, reaching 26 feet with a 270-degree rotation. **888/442-7829; www.gapvax.com.**

Water-recycling combination unit

23 The **RECyler** combination unit from **J. Hvidtved Larsen US** can be used to jet water mains regardless of whether you need to remove blockages, carry out preventive cleaning, clear new sewers of construction gravel or clean prior to guided camera inspection and relining. The jetting water is cleaned and reused, and requires nothing more of the operator than traditional combination units. **312/705-3813; www.hvidtved.com.**

Pumping/jetting truck

24 The **Berringer** pumping/jetting truck from **Keith Huber Corporation** safely provides deep vacuum power (1,000 cfm) and high-velocity air induction with pressurized tank discharge at the push of a button. It is built to perform a variety of tasks including high-pressure waterjetting, ASME and DOT options for highway transportation of hazardous waste and auxiliary transfer pumps. It has a 3,300-gallon carbon steel tank with 5/16-inch shell, 20-inch top manway, full-opening hydraulically

operated rear door, hydraulic tank lift, full-length body trays for hose storage, 6-inch discharge valve for direct pressurized or gravity unloading, 4-inch intake valve for loading with internal standpipe, rear work lights and LED running lights, a backup alarm, grounding reel and operator-friendly push-button controls. Options include multiple tank capacities and configurations, a locking rear door, stainless steel tank with wetted stainless parts, high-pressure jetting systems with integral water compartment, auxiliary transfer pump and top-mounted hydraulically operated 6-inch boom with 4-inch hose. **800/334-8237; www.keithhuber.com.**

Stand-alone cleaning combination truck

25 The **PAT 360-HD** combination truck from **Polston Applied Technologies** is designed to remove sand, grit and other debris in difficult cleaning situations. It utilizes the Polston Process and COMBINATION 3 technology (a combination of jetter, vacuum and downhole pump) to provide a complete, stand-alone cleaning system. It utilizes four 8-inch hydraulic pumps (each pumping 2,500 gpm), enabling it to pump/separate sand and water at up to 10,000 gpm. It delivers up to 1,100 hp, providing maximum power to each of the components, providing the ability to remove submerged debris and handle low-viscosity fluids. It can perform in surcharged conditions, allowing the facility to remain online. It has an extra-long hydraulic knuckle-boom crane with up to 49 feet of reach from the center and 180-degree rotation to access hard-to-reach places. **844/765-7866; www.polstonprocess.com.**

Conventionally sized hydroexcavator

26 The **HX-15** hydroexcavator from **Ramvac by Sewer Equipment** has a 15-yard debris tank with a temperature-controlled environmental chamber and directional discharge system to off-load debris back into the excavation site when finished, without the mess of dumping the tank. It has a long-range wireless remote, NEMA 4 electrical system, a 400,000 Btu water boiler, a three-stage cyclonic filtration system and efficient 3,000 cfm blower. It is available with a RamAir air excavation system for when water cannot be added to the problem area. **800/323-1604; www.ram-vac.com.**

Combination truck

27 **Camel 900** and **1200** combination trucks from **Super Products** include cartridge filters, dig tubes and water lances on both 9-yard debris capacity units, as well as 12-yard units. Coupled with powerful water jetting and vacuum capability, utilizing these tools allows operators to safely and effectively expose utility lines, remove debris and clean out a variety of structures, dig in congested spaces and perform many other hydroexcavating applications. **800/837-9711; www.superproductsllc.com.**

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Large-capacity hydrovac

28 The **F4 Slope** hydrovac from **Tornado Hydrovacs** holds 13 cubic yards of mud and more than 2,100 gallons of freshwater. It includes a water boiler and a 3,600 to 6,300 cfm positive displacement vacuum blower to pull spoils to the tank via a boom. The boom has a 342-degree rotation and a 26-foot reach. All critical components are housed in an insulated and heated aluminum van body. Its mud sweep empties the tank without hoisting, which eliminates the dangers of dumping on uneven ground and around overhead power lines. **877/340-8141; www.tornadotrucks.com.**

TV INSPECTION CAMERAS

Pipeline inspection system

29 The **Pathfinder** pipeline inspection system from **Aries Industries** operates over long distances through harsh pipe conditions. The transporter sets up quickly to match pipe contours and conditions, and the adjustable camera lifts enable easy transitions from small to large pipes. A gear-driven drive train, powered by two continuous-duty motors, ensures navigation through deteriorating, debris-filled pipeline. The high-resolution camera and high-intensity LED array provides picture clarity and a rear-facing camera provides complete visualization and quick retrieval. An auxiliary high-power detachable light head provides clear images in larger pipes. It operates in 8-inch-diameter or larger pipes, and can be used in 6- to 24-inch sewer lines. **800/234-7205; www.ariesindustries.com.**

Digital Universal Camera

30 The high-resolution, digital CCTV, side-scanning **Digital Universal Camera** from **CUES** is designed for rapid and detailed condition assessment of a wastewater system. It can inspect and assess 5,000 feet or more per day, and produces a high-resolution digital video scan of internal pipe conditions in 6- to 60-inch pipe and a flat unfolded view of the pipe to facilitate rapid assignment of observations and for measurement purposes. This low-maintenance camera has no moving parts and is driven through the pipe without the need to stop or pan and tilt. Drive the unit on cruise control to the remote manhole or through multiple manholes for maximum efficiency. **800/327-7791; www.cuesinc.com.**

Mid-size color inspection camera

31 The **Model E5150** mid-size color inspection camera from **EasyCAM** has a lightweight portable design for roof, crawl space and hard-to-reach work areas. It weighs 33 pounds, and has 150 feet of heavy-duty pushrod, a 512 Hz transmitter and portable 7-inch daylight-readable monitor with recording and playback capability. Voice-over and 180-degree image inver-

sion is included. It provides cordless, safe 12-volt operation, with up to six hours of power between charges. It will also operate with any off-the-shelf monitor, laptop or recording device. **239/260-2056; www.easycamllc.com.**

Sled-design video nozzle

32 The **JetScan** video nozzle from **Envirosight** has a sled design that keeps footage smooth and upright, and which can be outfitted with extension rollers to handle larger-diameter lines. The stainless steel sled attaches directly to any 1-inch jetter hose (or 3/4 inch with available adapter) and has six propulsion nozzles, up to four of which can be swapped with blanks to achieve desired thrust versus water consumption. The sled allows viewing in pipes 8 to 15 inches, or beyond with optional roller extensions attached. As it advances down a pipe, it records 720p HD video in MPEG format to an onboard 32 GB SDHC memory card. Immediately afterward, the card can be removed and video viewed on an iPad or other SDHC-compatible device. **866/936-8476; www.envirosight.com.**

Inspection system with lay-flat reel

33 The **FB-PIC3588B/3588BT** camera system from **Forbest Products** comes with 200 feet of 3/8-inch fiberglass cable and a lay-flat reel with footage counter and stand. The high-resolution 1 1/2-inch waterproof metal color camera head with or without built-in 512 Hz sonde transmitter is designed to inspect drain/sewer lines 3 inches or larger. With an adapter, a 7/8-inch color waterproof camera head with built-in transmitter can be used on the reel for smaller pipe. The heavy-duty waterproof control box includes a bright 10-inch LCD color screen and a built-in SD card reader with one-touch record button to record photos and videos. On-screen status indicators include footage of the cable pushed through the pipe and battery strength. The built-in rechargeable battery lasts about four hours. **650/757-4786; www.forbestusa.net.**

Hand-held inspection camera

34 The **Gen-Eye Micro-Scope** compact hand-held inspection tool from **General Pipe Cleaners** is versatile enough to inspect small drainlines and many toilet traps, and hard-to-reach places like duct work, furnaces and crawl spaces. The monitor attaches to the reel with an adjustable mount to provide the best viewing angle. The reel carries up to 100 feet of micro pushrod with a color camera, providing the ability to inspect 1 1/2- to 3-inch drainlines and many toilet traps. The 39-inch probe rod is used to inspect in hard-to-reach places. Three attachments improve your viewing angle or retrieve objects. The monitor has a bright 3.5-inch LCD screen and built-in SD card reader with one-touch record button. It includes a digital zoom, rotatable picture, voice-over recording, LED bright-

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ness control and a USB port. On-screen status indicators include date and time, SD card capacity and battery strength. The rechargeable battery powers the unit for up to four hours. **800/245-6200; www.drainbrain.com.**

Pushrod crawler system

35 The **P350 flexitrax** from **Pearpoint/SPX** has the simplicity and transportability of a pushrod system while delivering the functionality and performance of a crawler system. Its modular structure allows all its main components to be fully interchangeable. Modules available include a manual or powered drum, three interchangeable cameras, a range of wheels and tires, and multiple cable lengths and crawler sizes. The command module is also fully compatible with the P340 flexi-probe, giving users access to a range of pushrod reels, cameras and accessories. A built-in digital recording and reporting system is standard. It can be van- or truck-mounted or can be wheeled on site using the transportable ergonomic barrow design. Once on site, the system is quick and easy to set up, deploy and use. **800/688-8094; www.radiodetection.com.**

All-weather inspection system

36 The **GatorCam4** inspection system from **Radiodetection Corporation** is rugged and compact, and offers the convenience of a portable system that can be used in most weather conditions. It delivers high-quality inspection in almost any situation, from residential work and commercial use, to specialist plant and municipal applications. It has a lithium-ion battery that removes the inconvenience and setup time of an external power lead. A push-button fuel gauge provides a quick indication of remaining power even when the controller is switched off. A range of pushrods is available, from the extra-flexible 100-foot plumbers reel to navigate the bends and traps found in commercial and residential plumbing, up to the 500-foot extra-stiff rod designed to push for longer distances. **877/247-3797; www.radiodetection.com.**

Pan/tilt/zoom push camera

37 The **MiniLite** pan/tilt/zoom push camera from **RapidView IBAK North America** allows users to inspect, record and measure the internal dimensions of smaller pipelines. During normal inspection, users can accurately capture diameter measurements with one touch using the **ORION Zoom Camera**. The system includes a cable coiler cartridge that makes replacement easy, a portable command console and one of several choices of cameras. It has a high-visibility 10.4-inch monitor and a full QWERTY keyboard. Inspections are recorded on a built-in MPEG digital video recorder on SD and SDHC memory cards. It is available in 100- and 130-foot lengths. **800/656-4225; www.rapidview.com.**

Wi-Fi camera system

38 The **Elite SD Wi-Fi** pipeline inspection camera system from **Ratech Electronics** allows operators to record pipe inspections wirelessly to an iOS or Android device, and take live video and digital still photos to immediately upload to YouTube. It doesn't require USB thumb drives, SD cards or DVD discs. Operators can download an app to an iPhone or iPad and stream the video wirelessly. The Wi-Fi interface is available on any current Ratech product or existing systems in the field and is available with a sun-readable 10-inch LCD monitor and either a self-leveling, ultra-micro or pan-and-tilt push camera. Systems come in cable lengths from 100 to 400 feet. **800/461-9200; www.ratech-electronics.com.**

Modular pipe inspection camera

39 The modular **M-Series** pipe inspection system from **Rausch Electronics USA** is designed around the four-wheel-drive steerable crawler/tractor platform L135. Each camera and module is interchangeable via a quick-connect connector. The pan-and-tilt mainline TV camera mounts onto the electric lift of the crawler to inspect pipe diameters from 5.5 up to 60 inches. To upgrade the system to perform lateral launch inspections, remove the camera module from the crawler and attach the lateral launch module with the pan-and-tilt lateral camera. Lateral launch systems can push the lateral camera up to 160 feet into the lateral, and can negotiate branched laterals with a steering pin. It takes less than two minutes to switch the modules from mainline to lateral inspection, or vice versa. **717/709-1005; www.rauschusa.com.**

Jet-propelled inspection system

40 The **Jet Propelled Inspection System** from **RS Technical Services** is powered by a jetter's 12-volt DC system and allows the operator to see the condition of the pipe and cleaning results instantly. It has an easy-to-install reel and controller system, 600 feet of lightweight single conductor cable on a motorized reel with torque control, an LCD monitor with high-resolution display, nine high-intensity LED lights, recording capability to a flash or USB drive and an optional on-screen footage counter display. **800/767-1974; www.rstechserv.com.**

Pipe inspection camera

41 At 25 pounds, the **SparVision 200** pipe inspection camera from **Spartan Tool** is self-contained in a single unit for easy on-the-job maneuverability. It comes with the choice of an iPad Air or Android-based Nexus 10-inch tablet for the viewing screen or an operator's own device can be supplied. It has 200 feet of ultra-slick pushrod and a color self-leveling camera head. It provides instant snapshots, an on-screen key-

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board and telestration drawing ability, a 512 Hz locating beacon and distance counter. **800/435-3866; www.spartantool.com.**

Jetting camera

42 The **Jet Cam** camera system from **US Jetting** transmits jetting images down the high-pressure hose to a screen mounted on the cart, eliminating external cables or pushrods. It has six rear firing jets for propulsion and two thrust jets, one of which is located on the camera head. This allows the camera to make 90-degree turns, and gives the camera the ability to rise above the water in a semi-flooded pipe. The thrust jets allow it to go down a straight line and then up a lateral by rotating the hose by hand. It offers up to 200 feet of high-pressure hose and is capable of running up to 1,800 psi at 10 gpm. It comes with an over-pressure relief valve and a stainless steel collapsible cart with wheels. It can record on a flash drive for later reviewing. The battery-powered unit is good for at least two hours of operating time. **770/740-9917; www.usjetting.com.**

Long-distance inspection system

43 The **vCam-5** inspection system from **Vivax-Metrotech Corp.** has the ability to locate the entire length of pushrod, in addition to having a locatable sonde. Simply connect the hot lead from a cable locator transmitter to the reel and the ground lead to ground. The Type-CP Systems reel comes with either 200 or 400 feet of 12 mm Kevlar-reinforced pushrod stiff enough for long distances and flexible enough for easy entry and turns. The control module has a day-light-readable display, volume control, wireless mouse support and RS232 support for MuniXS, POSM and WinCan software. **800/446-3392; www.vivax-metrotech.com.**

Visual inspection camera

44 The **VIS 350 Plus** visual inspection camera system from **Wohler USA** comes with both a 1 1/2-inch, 360-degree pan and 180-degree tilt camera head, and a 1-inch, straight camera head. Both are waterproof and have LED lights with adjustable brightness levels for an all-encompassing view. Follow the camera's path on a color monitor and watch as it glides around 90-degree bends and up to 100 feet away. The digital-distance measurement feature pinpoints the exact location of trouble spots. It can take still photos and record video via SD card or USB port. It is packaged in a tough, self-contained carrying case and comes with two rechargeable batteries providing up to four hours of mobility. **978/750-9876; www.wohlerusa.com.**

INSPECTION SOFTWARE/PRODUCTS

CCTV GIS connection application

45 A set of applications from **Cobra Technologies** makes the interaction between CCTV inspection and Esri ArcMap easy to use, requiring minimum user interaction for data exchange with complete detail in GIS maps. Users export inspections from the Cobra Toolbar into ArcMap to create prepopulated projects and linked maps, and supplement GIS data with additional infrastructure detail. During review the user will have access to the inspection video to allow for comparison of the data against the video file. Arc Map tools allow for filtering on the map and color coding CCTV inspections using the inspection date, observation type (e.g. roots), inspection status (e.g. completed, abandoned) and PACP ratings. The GIS module for the pipe inspection management software assists municipalities in managing sewer and stormwater infrastructure using GIS data. **800/443-3761; www.cobratec.com.**

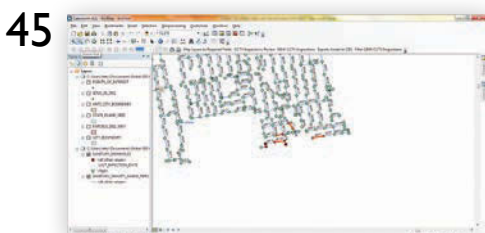
Sewer line assessment tool

46 The **Sewer Line Rapid Assessment Tool (SL-RAT)** from **InfoSense** provides collection system operators with a practical new tool for focusing camera and cleaning efforts on dirty gravity-fed lines. It exploits the fact that sound energy flows similarly to water through a pipe, "yelling" in one manhole and "listening" in an adjacent manhole to provide an overall blockage assessment. It is highly portable with ruggedized field-tested construction, and doesn't require confined space entry and waste flow contact. Operators can be trained in minutes. Test results, including GPS coordinates, are immediately available with little interpretation required. Results can be saved to a cloud application for additional analysis. **877/747-3245; www.infosenseinc.com.**

Inspection reporting and asset management software

47 **WinCan VX** pipe inspection and asset management software from **Pipeline Analytics** emphasizes a productivity-oriented, fully customizable user interface with cloud-based data access. It also offers support for pipe cleaning, rehabilitation and leak detection, and augments existing functional areas like GIS, laser/sonar scanning, side scanning, image measurement and municipal database integration. It has been benchmarked on databases exceeding 5 million records. WinCan Analyst gives managers and engineers tools for understanding the maintenance needs of a collection system using WinCan VX data. It generates maps highlighting pipe material, size, rating, maintenance status and damage classification, and produces statistical reports listing assets by similar criteria. It contains tools

(continued)





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INDUSTRIAL VACUUM TRUCKS

Industrial vacuum loader

48 The **Guzzler Classic (CL)** industrial vacuum loader from **Guzzler Manufacturing** has enhanced operator ergonomics and improved air routing, filtration and maintenance. A longer body provides improved material separation. The standard ladder, catwalk and railing provide the operator with easier and safer access to the top of the truck. An enlarged bag house and cyclone clean-out doors provide easier access. **800/627-3171; www.guzzler.com.**

Versatile service truck

49 The **VP Series** service truck from **Pac-Mac, a division of Hol-Mac Corporation**, comes with a 2,500-gallon tank with 66 inches OD and 156-inch shell length (also available in 1,500, 3,000, 3,500, 4,200, 4,500 and 5,000 gallons), a 1/4-inch thick shell and 5/16-inch nominal thick heads, right-angle drive pump system, 20-inch rear clean-out manway, 20-inch top manway, manway ladder with safety tread, bolt-on baffles and hose trays with drains, rear hose hooks, 4-inch intake and 6-inch discharge, and a premium two-component epoxy primer-sealer and polyurethane topcoat in solid and metallic colors. Options include a hydraulic-drive jetting system, 36-inch rear clean-out manway, multiple toolboxes, bed-liner applied to hose trays and tank, a chemical-resistant two-part epoxy interior liner, safety beacon, rear sump and stainless steel float level indicator. **800/844-3019; www.e-pac-mac.com.**

Wet/dry vacuum loader

50 The **Powervac Suck N Dump PD** blower wet/dry vacuum loader from **Presvac** operates as an air mover for dry applications, or can be used at full vacuum and extreme recovery rates for tough liq-

uid, sludge and slurry jobs. The material knockout feature in the debris tank minimizes carryover. Heavy-duty modular filtration is configured to blower size and application to provide blower protection and minimal maintenance. Blower options include Hibon, Roots or Robuschi, with full vacuum and 3,500 to 6,600 cfm. It has modular filtration optimized for cfm rating and application, along with 12-inch cyclone and baghouse dump chutes. Heavy-duty spring tensioned bolts allow for adjustment to maintain leakproof sealing. The dump chute doors open with the debris tank door. Options include stainless steel dump chutes, a boom, pressure off-load, water pump, soundproofing and heated valves. **800/387-7763; www.presvac.com.**

Industrial vacuum loader

51 The **Industrial Vacuum Loader** from **Vac-Con** was designed with a filtration system to handle lightweight dry material. It has superior airflow efficiency as standard equipment and applies options like Hi-Dump and the Automatic Material Return System. The single mode machines can recover wet or dry material with up to 28 inches Hg. Their positive displacement blowers are capable of pulling material distances as much as 700 feet. It is available with a hydroexcavation package that adds a powerful, high-pressure water system that works together with the vacuum system to effectively excavate around sensitive underground utilities, locate underground systems and excavate in areas with limited access. **855/336-2962; www.vac-con.com.**

Combination sewer cleaner

52 The **AJV R Series** combination sewer cleaner from **Vacall – Gradall Industries** has a rear-mounted hose reel located away from the engine, keeping it away from engine noise and providing an unobstructed view of the job site. Its heavy-duty tailgate has vault-style latches and a dual-cylinder lift system allowing optimized rear seal performance. Galvanized debris tanks with 6-, 8- or 10-yard capacities are available. **800/382-8302; www.vacallindustries.com.** ♦




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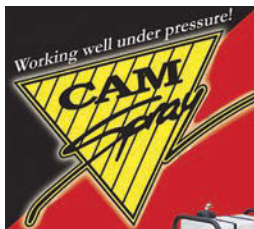
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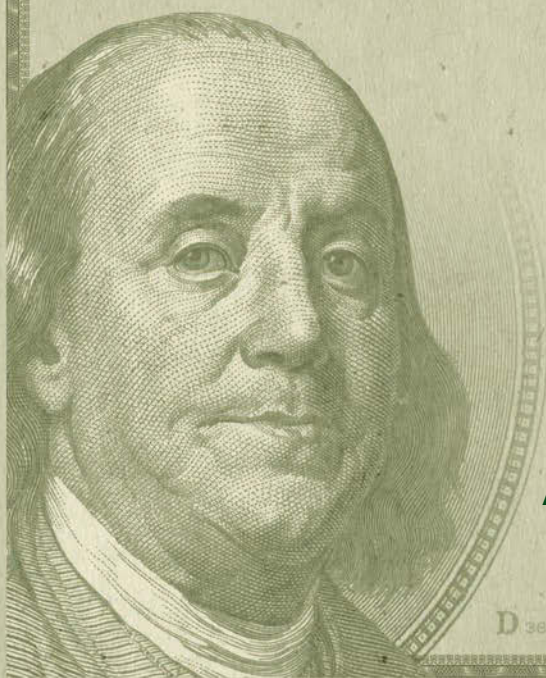
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Rotary impingement device quickly dislodges grease from lift station



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Ryland Holmes of Virginia Public Works Equipment, a municipal, high-tech and heavy-equipment needs company, was looking for a better way to clean lift stations. Customers were struggling with grease problems and needed an effective way to resolve their issues without demanding more of their manpower or budget.

Solution:

Gamajet, part of the Alfa Laval Group, provided the company with an EZ-8 automated rotary impingement device, configured for 80 gpm and 300 psi. Members of the City of Virginia Beach Department of Utilities and other local municipalities and sewer authorities watched a demonstration as the device, which was used with the department's jetter truck, scoured the wet well clean in 12 minutes. Another half-cycle was run to further decimate the grease pad, which could then be suctioned into a combo truck or washed downstream.

RESULT:

The lift stations were free of grease in 12 minutes without laborers entering the lift station, eliminating the hazardous, time-consuming confined-space-entry riggings. The city decided to purchase one of the units, and authorities are able to stay ahead of their lift station problems, provide better service to their constituents, increase safety and reduce demand on their resources. 877/426-2538; www.gamajet.com. ♦

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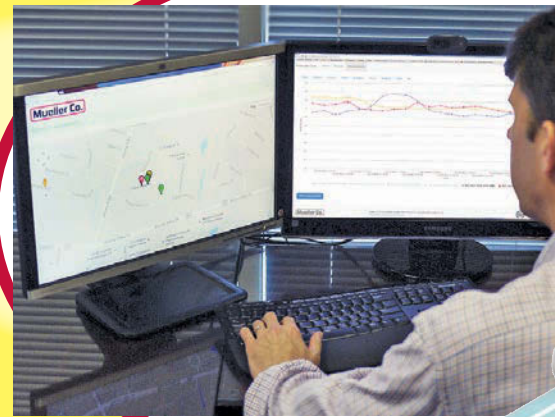
By Ed Wodalski

The remote pressure monitoring system, part of the Intelligent Water Technology portfolio of products from Mueller Co., reports pressure data at customer-defined intervals via a machine-to-machine cellular-based service or a Mueller advanced metering infrastructure network. The GIS map interface can be viewed with any Web browser. Made for ease of use and installation, alerts are transmitted via SMS and/or email when user-defined settings for low- or high-pressure conditions are reached.

Designed to reduce non-revenue water, identify potential infrastructure failures related to pressure fluctuations, reduce pumping costs and improve public safety, the monitoring system includes a remote telemetry unit (RTU), adjustable top, composite valve box, sensor transducer, ball valve and service saddle. A one-year, renewable contract includes five-year minimum lithium battery and one year of cellular service.

"Some municipalities don't recognize pressure as an issue in their system," says Paul Gifford, director of research and development for Mueller Co. "High pressure in a system is going to increase leak rates. The more leakage you have, the more water you have to treat and pump to customers. So reducing pressure to a level that is acceptable and holding it there can maximize the efficiency of your system."

The RTU is H-20 traffic rated, per the American Association of State Highway Transportation Officials, and houses the circuit board, antenna



and replaceable battery. An optional lock is available.

"All of your communication hardware is accessible from the surface," he says. "It's also determining by GPS the location, date and time."

The 12-inch ductile iron top inserts inside the composite polymeric valve box for field adjustability.

The sensor transducer, typically installed two per district metering area or neighborhood, captures and transmits data from the installation point to the RTU via an 11-foot cable (extensions available). The sensor transducers should be located at the low and high elevations in each zone. The standard pressure transducer is rated at 250 psi with a 300 psi option. The 300 psi-rated low-lead ball valve is manufactured in compliance with AWWA C-800 and the federal Safe Drinking Water Act.

"We designed it so the utility that only has 100 customers spread out down a lonely stretch of highway in Arizona can buy one and put it at the opposite end of the pipeline from their pumping station and know what's going on in between," Gifford says.

The monitoring system, which can be incorporated in a utility's SCADA system, has a temperature operating range of -30 to 150 degrees F. It can be installed by direct tap into the distribution main or into an existing valve box. **800/423-1323; www.muellercompany.com.**

New Way side-loader organics collection truck

The Roto Pac fully automated side-loader organics collection truck from New Way, a division of Scranton Mfg., has a 27-yard leak-proof body and 25,000-pound payload capacity. The truck features a self-cleaning, auto-reverse auger that produces 23,000 pounds of torque at idle. The unit can lift 500 pounds at its maximum reach of 144 inches. A tapered body design enhances dumping. **800/831-1858; www.newwaytrucks.com.**



Makita 14-inch power cutter

The EK6101 14-inch 61 cc power cutter from Makita U.S.A. has a cutting depth of 5 1/8 inches. Weighing 19.6 pounds, the cutter has a no-load speed of 9,850. Sliding front engine mounts help absorb vibration by detecting when cutting pressure is applied. Rated at 97 decibels, the tool cuts metal decking, angle iron, I-beams, cast iron pipe, brick/masonry, stone/concrete blocks, rails, road curbs and asphalt. **800/462-5482; www.makitausa.com.**



Bilco intruder door defense system

The Barracuda intruder defense system from Bilco is a free-standing door security device that locks down doors in an emergency. The powder-coated steel finish device is adjustable to accommodate varying door widths and is available in different models to protect inward and outward swinging doors. **203/934-6363; www.bilco.com.**



Vermeer S3 Navigator horizontal directional drill

The D20x22 S3 Navigator horizontal directional drill from Vermeer features 19,550 pounds of thrust/pullback with 2,250 ft-lbs of torque. Powered by a 74 hp Deutz engine, the drill has a carriage speed of 167 fpm and can climb and



track at 3.3 mph. **888/837-6337; www.vermeer.com.**

Brentwood stormwater management system

The StormTank Pack stormwater management system from Brentwood is designed for non-load bearing, subsurface applications, including infiltration and integration in bioretention and rainwater harvesting applications. The system yields a 95 percent void space and utilizes crossflow media, evenly distributing stormwater runoff to the base. It can accommodate layout variations, be cut to any length and does not require assembly. **610/374-5109; www.brentwoodindustries.com.**



Sherwin-Williams polyurethane pipe coatings

Chemical and abrasion-resistant Poly-Cote 110 Fast Set, Poly-Cote 110 Rapid Set, Poly-Cote 115 and Poly-Cote 115FR from Sherwin-Williams Protective and Marine Coatings are NSF certified up to 250 mils. The performance characteristics of the Poly-Cote line exceed the minimum requirements of AWWA C222-08, polyurethane coatings for the interior and exterior of steel water pipe fittings. Poly-Cote 110 Fast Set is formulated for exterior pipe applications and has a drying time of five to 10 minutes. Poly-Cote 110 Rapid Set is designed for interior pipe applications and provides a dry-to-handle time of 20 to 25 minutes. Poly-Cote 115 is a flexible coating developed for small fittings, elbows, valves and other tight work spaces. Poly-Cote 115FR comes in a kit for coating welds and damage repairs. **800/524-5979; www.sherwin.com/protective.**



Agru America concrete liners

Sure-Grip concrete liners from Agru America are designed for aggressive and abrasive media inside tanks, pipes and other structures. When combined with distance sheets, the protective liners meet requirements for storing environmentally hazardous media. Joined by ultrasonic welding, the space between the two sheets permits monitoring for leak detection. The surface pattern also facilitates self-cleaning for reduced sedimentation. **800/373-2478; www.agruamerica.com.**



Fibrelite lightweight composite covers

Corrosion-resistant fiber reinforced plastic covers from Fibrelite are designed to eliminate unsafe manual handling of concrete and cast iron access covers. Two lifting points for specially designed lifting handles enable workers to remove covers without bending over. Covers are available with company logo and in multiple colors. **800/421-3297; www.fibrelite.com.**



Armstrong three-speed circulators

The Astro 2 wet-rotor circulator from Armstrong Fluid Technology features flange-to-flange and bolt-to-bolt compatibility with all competing models, three field-selectable operating speeds, plug-in terminal strip and e-coating on the inside of the cast iron volutes. The pre-installed high-flow check

valve is available in cast iron, stainless steel and lead-free bronze. **416/755-2298; armstrongfluidtechnology.com.**

BAYCO multifunction LED flashlights

Nightstick multifunctional MT-200 Series Mini-TAC pro flashlights from BAYCO Products are 4 to 5.5 inches long and weigh 1.9 to 3.2 ounces. Made of blue anodized aircraft-grade 6061-T6 aluminum, each flashlight (MT-200, MT-210, MT-220, MT-230) has a drop rating of 2 meters and waterproof rating of IPX7. All lights feature CREE LEDs with a deep parabolic reflector for a tight, long-throw beam. The flashlight body and tail switches provide momentary or constant-on functionality with high, medium or low settings, as well as strobe. **800/233-2155; www.baycoproducts.com.**



Oldcastle reinforced concrete pipe

Reinforced concrete pipe from Oldcastle Precast, designed for stormwater transmission, can be manufactured to custom specifications. Sanitary liner systems are available. Circular pipes range from 15 to 48 inches I.D. and 19.5 to 58 inches O.D. Elliptical sizes include 12 by 18 inches (15-inch round equivalent), 14 by 23 (18-inch equivalent), 19 by 30 (24-inch equivalent), 24 by 38 (30-inch equivalent) and 29 by 45 (36-inch equivalent). **888/965-3227; www.oldcastleprecast.com/wastewater.**



Snap-on bimetal bandsaw blades

Bahco Easy-Cut bimetal portable bandsaw blades from Snap-on Industrial Brands cut conduit, galvanized and PVC pipe, rebar, angle iron and wood. The blades are available in 32 7/8- and 44 7/8-inch lengths. **800/446-7404; www.snaponindustrialbrands.com.**



Trimble laser level

The Spectra Precision LL300N laser level from Trimble is designed for general construction, concrete and site preparation applications. Featuring a glass light-house, the one-button operation level has an IP66 environmental protection rating for use in adverse conditions. It can withstand 3-foot drops onto concrete and tripod tip-overs up to 5 feet. **800/527-3771; www.spectralasers.com.** ♦



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PEOPLE/AWARDS

The **City of Lafayette** received a Community Achievement Award from the Indiana Association of Cities and Towns for its environmentally friendly Durkees Run Stormwater Park.

The **Water Environment Federation** announced the winners of its 2014 StormTV Video Project. Videos from nonprofit organizations, government entities, consulting firms and equipment manufacturers were judged based on innovation, message communication, visual appeal and quality, content matter and relevance. To view the videos, visit WEF's YouTube Channel under the StormTV Project playlist. Winners include:

- Nonprofit and Government Programs Category: Onondaga County, N.Y., "Onondaga County Save the Rain"
- Public Education and Outreach Category: Think Blue Maine, "Think Blue Maine – Ducky II ad"
- For-Profit Projects Category: The City of Chattanooga, Tenn., Andropogon Associates, Arcadis and the Chattanooga Metropolitan Airport, "Brainerd Rd Draft Part 2"
- Equipment Category: WesTech Engineering, "Stormwater Solution for Springfield, Ohio, Plant"

The **Volkswagen Group of America** received a regional 2014 Rain Catcher Award from the Environmental Protection Agency in the Commercial Category for the Chattanooga, Tenn., assembly plant. The facility is the world's first LEED platinum certified automotive facility. The facility voluntarily set aside at least 20 percent of the property as open space and implemented a host of practices aimed to protect stormwater. These practices include the use of bioswales in the facility parking lots and the construction of 3.3 miles of stream and 2.8 miles of greenspace. The site collects stormwater from its roof for use in its cooling tower and toilets.

The **Alewife Stormwater Wetland** project received a 2014 Public Works Project of the Year Award from the American Public Works Association. The Cambridge Department of Public Works, as the managing agency, P. Gioioso and Sons Inc., as the primary contractor, and Kleinfelder/MWH/Bioengineering Group, as the primary consultant, shared the honor. The project, which was awarded in the "Environment: \$25 million to \$75 million" category, demonstrates how innovative approaches to science, engineering and ecology can concurrently resolve infrastructure problems, enhance the environment and provide open-space resources to the community.

LEARNING OPPORTUNITIES

American Public Works Association

The American Public Works Association is offering a Sharpen Your Executive Soft Skills audio/Web broadcast on Dec. 4. Visit www.apwa.net.

American Society of Civil Engineers

The ASCE is offering the following courses:

- Dec. 4-5 – Stormwater Treatment Using Detention Ponds and Commercial Devices, Tampa, Fla.
- Dec. 11-12 – Financial Management for the Professional Engineer, Philadelphia
- Jan. 8-9 – Pumping Systems Design for Civil Engineers, Las Vegas
- Jan. 15-16 – Leadership Development for the Engineer, Dallas
- Jan. 22-23 – Financial Management for the Professional Engineer, Seattle

Visit www.asce.org.

Wisconsin

The University of Wisconsin Department of Engineering-Professional Development is offering Using WinSLAMM v.10.1: Meeting Urban Stormwater Management Goals on March 23-24. Visit <http://epdweb.engr.wisc.edu>.

The Wisconsin Department of Natural Resources is offering a General Safety seminar on Dec. 9 in Plover. Visit <http://dnr.wi.gov>. ♦

CALENDAR

Dec. 10-12

Florida Stormwater Association Winter Conference, Renaissance Orlando at SeaWorld, Orlando, Fla. Call 888/221-3124 or visit www.florida-stormwater.org.

Feb. 17-20

American Water Works Association Utility Management Conference, Hyatt Regency Austin Hotel, Austin, Texas. Visit www.awwa.org.

March 30-April 1

American Water Resources Association Spring Conference: Water for Urban Areas, Los Angeles Airport Hilton, Los Angeles. Visit www.awra.org.

April 12-15

American Public Works Association North American Snow Conference, DeVos Place, Grand Rapids, Mich. Visit www.apwa.net.

June 7-10

American Water Works Association Annual Conference and Exposition, Anaheim, Calif. Call 303/347-6181 or visit www.awwa.org.

July 26-29

American Society of Agricultural and Biological Engineers Annual International Meeting, New Orleans. Visit www.asabe.org.

Aug. 2-6

StormCon North American Surface Water Quality Conference & Expo, Austin, Texas. Visit www.stormcon.com.

Aug. 30-Sept. 2

American Public Works Association International Public Works Congress and Exposition, Phoenix Convention Center, Phoenix. Visit www.apwa.net.

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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APWA awards CPII, CSM certifications

Eighteen professionals earned American Public Works Association certified public infrastructure inspector (CPII) credentials. They included Mohammed Barkatullah, Michael Ewers, Sven E. Flodstrom, Abdul Molz Mohammed and Jesse T. Singer, Chicago; Shane D. Bennett, Saratoga Springs, Utah; David J. Bruce, Visalia, Calif.; Danny Casals, Palmetto Bay, Fla.; Gregory Gibbs, El Cajon, Calif.; Daniel R. Jacobsen, Kennewick, Wash.; James D. Jennings, Fairfax, Va.; T.J. Kelly, O’Fallon, Mo.; Andy J. Liebmann, Rosemount, Ill.; Corey T. Mase, St. Charles, Ill.; Cary Necaise, South Jordan, Utah; Christopher M. Reed, Billings, Mont.; Colin R. Roich, Plano, Texas; and John F. Stone, Abington, Mass.

APWA also awarded certified stormwater manager (CSM) certificates to Tanna L. Boisvert, City of Arvada, Arvada, Colo.; Michael G. Burgess, Columbus Consolidated Government, Columbus, Ga.; Wendy G. Eddie, City of Bend, Bend, Ore.; Peter S. Fortin, City of Chesapeake, Chesapeake, Va.; Timothy J. Pollizzi, City of Rochester Hills, Rochester Hills, Mich.; and John F. Schexnayder, URS Corp., Baton Rouge, La.

CH2M HILL raises \$250,000 for charity

CH2M HILL employees donated \$250,000 to Water for People during the company’s annual Workplace Giving Campaign. Contributions came from 21 countries on six continents. Water for People strives to provide clean water for every family, school and clinic in the regions it serves.

Franklin acquires pump, fueling operations in India

Franklin Electric acquired Pluga Pumps and Motors in Vadodara, Gujarat, India, and Franklin Fueling Systems acquired Wadcorpp India in Mumbai, Maharashtra, India. Pluga designs, manufactures and distributes groundwater motor and pumping equipment through 11 branch offices in India. Wadcorpp distributes fueling equipment throughout India.

CNP acquires worldwide patent licenses

CNP-Technology Water and Biosolids Corp., a newly formed wastewater treatment technologies provider, acquired worldwide patent licensing for AirPrex from P.C.S. GmbH in Hamburg, Germany. CNP’s flagship technology, AirPrex, is a sludge optimization process that recovers high-phosphate mineral struvite after anaerobic digestion but before the dewatering process. Based in Racine, Wis., CNP North America also has locations in Germany and China.

Electric Eel offers instructional video

Electric Eel Mfg. offers an instructional video for the Ace and Ace 2 pipeline inspection camera systems on its website, www.electriceel.com/ecam_ace-ace2_instructionalvideo.htm. The video includes basic operation with easy-to-follow instructions.



Tideflex names product manager

Tideflex Technologies, a division of Red Valve Co., named Paul Handke Tideflex Mixing System product manager. A former Pennsylvania water and wastewater operator, he will focus on TMS sales.

Rhino Linings sponsors NASCAR truck race

Rhino Linings Corp. signed a multiyear agreement to be the title sponsor of the NASCAR Camping World Truck Series race at Las Vegas Motor Speedway.

Vac-Con employees collect clothing, school supplies

Vac-Con employee owners held a clothing drive to benefit the Mission House, donating 2,333 items weighing 1,761 pounds. In 2013, Mission House helped 51 people living on the streets of Jacksonville, Fla., return to self-sufficient lives. Employees also held a school supply drive benefiting Project Reach Kids, an organization that helps 1,100 homeless children in Clay County each year.



HD Supply Waterworks moves to new headquarters

HD Supply Waterworks relocated its St. Louis corporate headquarters and training facility to 1830 Craig Park Road, Maryland Heights, Mo. The 60,000-square-foot building houses the company’s executive, administrative, sales, marketing and operations teams.

Vermeer names president, board chair

Vermeer named third-generation family member Jason Andringa company president and chief executive officer. Mary Andringa, president and CEO, will transition to board chair. Board chairman Bob Vermeer will serve as chair emeritus.



Jason Andringa

Mary Andringa

Milliken acquires Pipe Wrap

Milliken Infrastructure Solutions acquired the assets of Pipe Wrap’s pipe repair business. Based in Houston, the company provides custom solutions for structural reinforcement, leak repair and corrosion prevention.

GapVax launches hydroexcavator rental company

GapVax launched GapVax Rental Units (GRU). Based in Deer Park, Texas, GRU offers daily, weekly or monthly rentals of GapVax HV-55 hydroexcavators with plans to add other models.



Southland Tool earns ISO 9001-2008 certification

Southland Tool has been certified ISO 9001-2008 compliant after less than four years in operation. The company’s rapid growth and success led them to apply and obtain the ISO certification, which will ensure stability and a quality manufacturing process for years to come. The certification shows a commitment to quality management and control as well as a commitment to Southland’s employees and the long-term success of the company. Southland is the only company in this field that is ISO 9001-2008 certified, which is a benefit to Southland Tool dealers in the USA and worldwide.

USB – Duesen GmbH celebrates 25th anniversary

USB –Duesen GmbH, a leading manufacturer of innovative, high performance sewer cleaning equipment, celebrated the 25th anniversary of its operations in Germany and the 10th anniversary of USB – Sewer Equipment Corporation in the U.S. and Canada. ♦

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