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## DOING THE JOB IN-HOUS

Putnam County saves time and money tackling the challenges of hilly terrain and a recurring hydrogen sulfide problem

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Tom Forth Foreman of Maintenance and Construction Putnam Public Service District Scott Depot, West Virginia

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Tom Forth, foreman of Maintenance and Construction at the Putnam Public Service District, on the site of a manhole rehabilitation project in Scott Depot, West Virginia. (Photography by Sam Owens)



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## MORE THAN PIPES

Your people are your system's greatest asset and its greatest agent of change



FROM THE EDITOR

Luke Laggis

hat does the ideal version of your water or wastewater system look like? What does optimum performance mean to you? Is it about the condition of your pipes or the quality of your people?

I pose those first two questions because I think a lot of people frame the overall state of their utilities in terms of infrastructure grades, and rightfully so in many ways. Since I became editor of *MSW* a few years ago, I've read countless stories about the failing water and wastewater systems across the U.S. and the billions of dollars it will take to bring that infrastructure up to standards.

Reports detail sanitary and combined sewer overflows, crumbling networks or pipes and endless references to infrastructure reaching the end of its expected life span. Few utilities have the funding to get



on top of the problem and replace infrastructure at a faster rate than it's decaying. It's easier for municipal boards to approve Band-Aids than bona fide solutions. So utilities trudge on, spending more money on emergency repairs than rehabilitation and replacement projects that would save huge sums of money over the long term.

That third question, about pipes versus people, is aimed at the root of how you approach this problem. For most, operating budgets far outweigh capital budgets. Utilities spend a lot of money on their people. Creating an environment where those people can realize their full potential — where innovation is celebrated and everyone is invested in the successes and failures of the department — is going to be a big part of the solution going forward.

The Powdersville (South Carolina) Water District, one of the utilities profiled in this issue of *MSW*, provides a good example of how people are just as important — if not more so — as pipes. Powdersville has become a nationally renowned water utility, one of only 11 to receive the prized Directors Award in the Partnership for Safe Water's Distribution System Optimization Program.

The improvements at Powdersville are the result of the communication and interaction among the staff. Using monthly meetings that can last up to three hours, a cross-cut of employees from various departments within the Powdersville Water District discuss goals and agree on projects and directions the district undertakes. Everyone has input, and everyone learns from one another.

Powdersville is a rapidly growing community. The utility is busier than ever, yet while the workload has doubled over the past couple years, it hasn't had to add any more personnel. Everyone wears multiple hats and everyone is focused on doing more with less.

There has been an investment in the infrastructure — from metering upgrades to storage and distribution line improvements, and a SCADA overhaul — but it's the teamwork and dedication to constantly improving service that has made the difference in Powdersville. New meters may improve efficiency, but quality people change the system.

This month's Human Side column, about developing talent and leadership, dovetails nicely with this idea. The theme is consistent with the Powdersville story — people make the difference — and the column provides some insight and advice on helping your staff become agents of change.

I hope you find these stories valuable. Enjoy this month's issue. ◆

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

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owdersville Water District Superintendent hris Rasco (standing) meets with his ystem optimization team. The regular teetings have played a huge role in the tility's success. (Photography by Ken sburn)

## BUYING INTO THE SYSTEM

Powdersville focuses on system optimization and takes big steps forward

By Jim Force

FOCUS: WATER

South Carolina's Powdersville Water District was the first water utility in the state — and only the 11th in the nation — to receive the prized Directors Award in the Partnership for Safe Water Distribution System Optimization Program. And if you ask Operations and Maintenance Superintendent Chris Rasco, it's all due to the people.

"You have to have 100 percent buy-in from your staff in order to be successful," Rasco says. "In our case, we're all in."

Using monthly meetings that can last up to

three hours, a cross-cut of employees from various departments at PWD discuss goals and agree on projects and directions the district undertakes.

"All 23 employees are on

board and remain passionate about what we do for a living," Rasco says of his staff. "We made the commitment (to fulfill the requirements of the System Optimization Program) and we are tasting success. We all have input, and we learn from each other."

He also credits the American Water Works Association and Powdersville's executive director for their support. "They were a great resource," he says.

#### A little history

The Powdersville Water District was formed in 1971. It supplies an average of 3.5 mgd of highquality water to approximately 12,500 connections through a 400-mile distribution network. Storage is 3.6 million gallons and consists of a relatively new 1-million-gallon elevated tank, two 300,000-gallon elevated tanks, and two 1-milliongallon ground storage tanks.

Source water is supplied by Greenville Water, which pumps from Lake Keowee; the Anderson

growing rapidly. As a bedroom community for Anderson and Greenville, Powdersville is seeing numerous new subdivisions and commercial developments opening each year. "We're busier than ever," Rasco says. "Our workload has easily doubled in the past two years." But Rasco's team hasn't had to add more personnel. "Everyone rolls up their sleeves and wears many hats," he says. "The majority of the staff manages numerous duties that go beyond their original job description."

It wasn't always this way. When the district was

formed more than 40 years ago, founding members of the organization went door to door selling taps in order to obtain enough customers to qualify for loans to fund the new system.

"All 23 employees are on board and remain passionate about what we do for a living. We made the commitment ... and we are tasting success. We all have input, and we learn from each other."

#### – Chris Rasco

Regional Joint Water System, which draws from Lake Hartwell; and the Easley Combined Utilities, which pumps from Saluda Lake.

Because of the hilly terrain and supply connections located at a higher elevation than the rest of the system, the district is completely gravity fed from the three sources. The district maintains one pump station merely to shave peak flows in the morning and afternoon hours.

The service area is located along the Interstate 85 corridor between Charlotte and Atlanta and is

#### **Optimization efforts**

The Directors Award from the Partnership for Safe Water recognizes water utilities that have voluntarily optimized treatment plant performance or distribution system operations in order to provide superior-quality water to all users. At Powdersville, the optimization process has been the standard since it became a special purpose district in 2001. From metering upgrades to storage and distribution line improvements, from *(continued)* 

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SCADA overhauls to dealing with high pressure, Powdersville is constantly working on ways to improve the delivery of water and service to its customers.

In 2008, the district converted from manual to drive-by radio read metering and more recently has been moving to a fully automated metering infrastructure system. Rasco recalls that the district first had to change out 7,000 old meters before it could switch to radio read and decided to do the work in-house. The move sped up the project by several months and also saved customers more than \$250,000.

"Now we're quickly moving toward a completed AMI system with readings transmitted through line-of-sight antennas," Rasco says. "This will give us the ability to communicate with customers and be more proactive. We'll be able to contact customers about possible water leaks discovered through monitoring, conserving water and thereby saving them money. It will eliminate the nasty phone calls for extremely high water bills.

"(AMI) turns customer service on its head," he adds.

Sensus is supplying the new AMI network, and Powdersville uses a Tyler Technologies billing system.

The utility has also upgraded its SCADA system with the consulting assistance of Glenmount Global Solutions of Charleston.

In another important move to automate the distribution system, Powdersville is using Telog Instruments for mobile pressure readings. "We used to use basic data loggers," Rasco explains. Distribution operator Nick Cumbow (left) watches as operations crew leader Stan Johnson excavates a failing waterline for replacement.

"We would put them out in the system, let them run for a few weeks, then go back out and retrieve the data."

The Telog units have changed all that. Rasco says the units let his staff know what's going on in the field instantaneously — either by texting, emailing or phoning a message to the operators. "We receive alerts based on our set high- and lowpressure limits as well as unit integrity," he explains. "Now if a battery dies in the field, we receive an alert rather than losing days worth of data (with the old system) and then scratching our heads over what happened."

Rasco says his crews sampled several mobile pressure readers but didn't find any that were as reliable as Telog. "We have 12 of them," he says, adding that customer service from the supplier has been very responsive.

The recorders perform a vital function in the Powdersville system because pressures are a big issue.

"Due to our varying hilly terrain, we have high system pressures," Rasco says, explaining this is a primary cause for leaks and breaks. To address the problem, Powdersville has identified highpressure areas and installed regional pressurereduction valves that have reduced system pressures in some cases from about 165 psi to 100 psi. Leaks and breaks due to excessive pressure have been reduced to near zero in areas protected by these valves, he says.

Pipe replacement is another tool. Rasco explains that as new installations

(continued)

#### PROFILE: Powdersville (South Carolina) Water District

### ESTABLISHED:

CONNECTIONS: 12,500

**AREA SERVED:** Northern Anderson and eastern Pickens counties

**STAFF:** 10 in operations, plus 13 more in customer service, finance and metering

#### **INFRASTRUCTURE:**

Treated surface water supplied by three water sources; 400 miles of distribution pipeline; 3.6 million gallons of storage

ANNUAL BUDGET: \$48 million (operations)

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#### PEOPLE MAKE IT HAPPEN

The old adage "Good people make a good system" is nowhere more relevant than at Powdersville (South Carolina) Water District.

"Six of our operators have earned Level A," explains Chris Rasco, Operations and Maintenance superintendent. "Plus we have two at Level B, two at Level C, and one at Level D."

It's a high percentage of certified state operators, and Rasco is very proud of that fact.

Five years ago, Justin Clemones was named South Carolina AWWA Distribution System Operator of the Year. "He's a very conscientious, dedicated employee," Rasco said in an article in *MSW* magazine at the time. "He's mechanically inclined, eager to learn, and a quick study. Show him something once and 99 out of 100 times he'll understand it."

Others have provided leadership as well, including operations crew leader Stan Johnson, a 15-year veteran of the Powdersville staff. Rasco says Johnson takes it upon himself to get things done. "He's very dedicated, a self-starter," says Rasco. "He's out in the field doing a lot of our project identification, system repair and planning. He's the one you want on site."

Another is Tracy Wyatt, construction and development coordinator. "Anytime we have a project, she does everything," Rasco says. "She is our first line with the developer and the contractor. She also manages our GIS system, makes sure all the money is appropriated correctly, and works with the operations staff helping with compliance."

Rasco goes on to praise his entire staff from operators to customer service to finance to metering technicians. "They're second to none."

Stan Johnson (right) and Nick Cumbow position a new section of 4-inch PVC pipe in the trench on a waterline replacement project.

are added, pressures have increased and old thinwall PVC pipe has been replaced with more robust ductile iron.

"This was pipe that had outlived its useful life," he explains. "We identified these areas through our leak counts and by using hydraulic modeling. We have included the replacements and upgrades in our annual capital improvement program." The result is a reliable water main with a designed fire flow and better service to rapidly developed areas served by the system.

#### Source water

While Powdersville is blessed with abundant water supplies from three different sources, the mixture presents another challenge that the district has dealt with successfully.

"Each of our three suppliers uses a different disinfection method," Rasco says. "One uses gaseous chlorine, another chloramines, and the third



uses the MIOX process."

Blending those waters with varying types of disinfectants can result in undesirable reactions, so Powdersville created four distinct pressure zones, forming physical barriers that keep the feed waters separate. "If the free chlorine interacted with the free ammonia from the chloraminated system, chloramine would form and we would lose our measurable free chlorine residual," Rasco explains. The system of valves and barriers prevents the different feed waters from coming in contact with each other.

"It's like mini-systems inside the larger water system," he explains.

Rasco says his system maintains a chlorine residual of around 0.5 ppm, a bit higher than the state requirement of 0.3 ppm. These levels were decided on through the DSO process.

Hach instruments monitor the disinfectant levels at the various tanks and entry points. As with Telog, Rasco says Powdersville is pleased with the customer service and response from Hach.

The DSO program is not the only improvement process at Powdersville. The district created its own in-house water evaluation and auditing program that tracks non-revenue water using AWWA-approved methods.

"We employ an annual water audit patterned after the IWA format," Rasco says, explaining that the data helps in his team's overall efforts to identify leaks and breaks.

The improvements at Powdersville are the result of communication and interaction among the staff. Rasco says the monthly meetings are spent discussing needs based on goals that the team has identified. Once the DSO assessment was completed, action items were identified with scheduled completion dates. The team continues to work toward completion of these items to attain full system optimization.

"Using a cost-of-service rate model, we update our financial plan each year that includes forecasted needs for 10 years into the future," Rasco explains. "We use this financial model to ensure that our rates (going forward) are adequate to meet our operational capital needs."

Powdersville has worked with a rate consultant since 2005 to maintain an accurate forecast of its financial needs. All financial plans are adopted by the district's nine-member board and

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#### Powdersville Water District Superintendent Chris Rasco shows off a COCORAHS (Community Collaborative Rain, Hail & Snow Network) rain gauge outside the district administrative office.

all actions are properly advertised to the district's customers. Public board meetings are held monthly and include time for public interactions at every meeting.

"Everyone on our staff understands that the public health and safety of 35,000 people are in their hands," Rasco says. "We take pride in that. Everyone here cares." ◆



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## DEVELOPING TALENT

Is your organization prepared for an exodus of retiring employees? If not, it's imperative to develop a strategic succession plan.

#### By Ken Wysocky

f businesses and organizations acted more like professional sports teams talent management, developing a deep bench of potential future stars would be top of mind. But more often than not, creating a succession plan to fill key positions is treated as an afterthought, lost amid the daily grind of business as usual or an overarching focus on areas such as technology and finances.

In fact, in many mature, slow-growth organizations, succession plans rely more on seniority than a strategic plan to determine what kind of talent is required to meet future objectives. "The danger is rewarding loyalty and longevity over talent," says Chris Miller, program director of executive development at the University of North Carolina Kenan-Flagler Business School. "You end up with a guy who stuck it out for 20 years and 'earned' the right to be a manager, even if he'll be a terrible manager.

"That's where the strategic part of talent management comes in," he continues. "Organizations need to figure out what they want to become. If they love what they are, they should keep hiring the way they always have. But if not, promoting the guy who's been with the company for 20 years probably isn't the best strategy. It all depends on what an organization wants to achieve."

Many organizations expect to face a wave of job openings in the coming decade as baby boomers retire, yet surveys show that most organizations are ill prepared for this game changer. For instance, only one-third of American employers have identified critical roles in the context of organizational goals. Moreover, less than 10 percent of companies surveyed said talent management was part of an annual business planning process. And only 7 percent actually had established a strategic talent management program.

Other surveys show a compelling case exists for aggressively managing talent. To wit, organizations with talent management programs report a 40 percent lower turnover rate and a 38 percent higher level of employee engagement than those with no program.

"A lot of human resources people get frustrated because they know talent management is important, but they struggle to be strategically relevant in organizations," Miller says. "Most human resource departments deal with avoiding risks and lawsuits and making sure organizations comply with laws. But avoiding harm is not the same thing as adding value."

So how do change agents get the ball rolling in the face of organizational inertia? The first step is to create a narrative that will win over executives. In mature organizations, that narrative might point out how the organization will suffer when many key employees retire (i.e., a dramatic loss of institutional knowledge) and that waiting to develop a talent pool will only deepen the misery. "If a large swath of people with technical knowledge are about to leave, talent management can suddenly become strategically important," Miller points out. In addition, it's helpful to present specific examples where a shallow bench, so to speak, resulted in failed initiatives or hurt chances for growth.

After an organization realizes the importance of talent management and

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

commits to making changes, a thorough assessment of goals and objectives must follow. In short, organizations must determine if their culture must change and, if so, figure out what that will look like. That, in turn, will determine what kinds of employees and skill sets will be required to shape that new culture.

"If you want to change how you do business, you have to decide what you want the culture to be and systematically assess the positions that create that culture," Miller explains. "You also must do gap analysis — figure out what you have and what you'll need for the future, which will reveal any deficiencies." That makes it possible to hire employees with the skills needed to move forward and lead change, he adds.

"If you want a new culture, you also need to determine what leadership behavior would look like in that culture," Miller suggests. "A lot of organizations promote command-and-control-style leadership where employees do what managers say, when they say it. That's not conducive to developing agile, dynamic employees who can think on their feet." As such, the new culture might do well to encourage a less militaristic approach to management that allows more decision-making capabilities further down the ranks, he says.

Talent management may look different for mature, slow-growth organizations. For example, mentorship might be a good option to minimize brain drain; organizations could consider a transition period where outgoing retirees might work as part-time Yodas, mentoring young Luke Skywalkers, Miller notes. "So much is lost in translation if there's no succession plan," he notes. "But the real challenge is getting those Lukes on board in the first place and keeping young people interested."

The notion of joining a company and waiting 15 years to become a manager and 25 years to become a director is no longer palatable to today's younger employees. The solution? "Don't let people sit in roles for 20 years," Miller advises. "Move them around, which will allow you to get a better sense if they're really good employees or just good at doing the same thing over and over. As they learn different roles, the bad employees will get flushed out and you can keep those who are good — and engaged.

"By rotating people early in their careers, they also become better leaders downstream," he continues. "Otherwise they only learn about the needs of their department or division, and when they get promoted higher, they're inclined to be more concerned about their former fieldom."

The wave of expected retirements could actually provide a good opportunity for human resource departments to advocate strongly for cultural change and a talent management program. Rare, indeed, is the senior executive who, within sight of a career finish line, is willing to embark on a painful extreme makeover of a corporate culture, Miller notes.

But no matter what you decide your organization should look like in the future, a deep bench will make all the difference. So go ahead and start planning — before it's too late.  $\blacklozenge$ 



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## DOING THE JOB IN-HOUSE

Putnam County saves time and money tackling the challenges of hilly terrain and a recurring hydrogen sulfide problem

By Dan Heim

The Putnam Public Service District is nestled against the foothills of the Appalachian Mountains in West Virginia's Putnam County. The hilly terrain is scenic, but it presents some significant challenges for the local collections system.

The PPSD provides sewer and water for the area. When established in 1959, the utility inherited a combined system, one of 712 remaining in the United States. Additional small combined systems were assimilated in the 1970s and '80s. PPSD is now engaged in an ongoing program of system upgrades and recently started an ambitious inhouse manhole, lift station and pipe rehab effort.

"When we started compiling our assets for GIS back in 2006 and began to video the pipes and manholes, we learned we had a real problem with hydrogen sulfide," says Tom Forth, PPSD foreman for Maintenance and Construction. "We've been working on it for 10 years now, just completed our GIS, and are starting to see some results."

Their 5,800 manholes, the oldest of which date to the 1970s, are a mix of concrete, brick and cinderblock. Those materials are prone to corrosion from sulfuric acid excreted by bacteria that "eat" hydrogen sulfide. And those manholes are the major source of I&I. PPSD also saw some acid damage in their lift stations and mains.

#### **Appalachian aggravations**

Being located in the foothills of the Appalachians brings many benefits, not the least of which is a reliable supply of drinking water from the local watershed. It needs to be processed but is relatively clean. No groundwater is required (beyond private wells in remote locations). PPSD has garnered several awards for their water quality.

But there's a dark side to that topography. The Scott Depot change in elevation over the PPSD service area requires 74 lift stations and mostly pumped lines. Gravity is used where possible, but excavation is complicated by rocky soil. Another complication is the widespread presence of expandable clays.

With the need for pumped lines comes the one need for grinders. "We use 350 E/One grinders, mainly where gravity is impossible," notes Forth. "There's some places where you just need to have force mains."

PPSD's customers are concentrated in three widely separated areas: along a 9-mile stretch of I-64 between Culloden and Teays Valley, a 5-mile stretch on both banks of the Kanawha River between Poca and Red House, and a 6-mile stretch downstream between Rumer and Fraziers Bottom.

Treatment plants are located where needed rather than piping all the sewage to fewer central plants. As it is, three of PPSD's pipes run under the Kanawha. "We've got five plants total," says Forth. "Two of them are ours and the rest are under contracts with other local governments. We're helping them reduce system costs and redundancies."

#### **Combined system**

PPSD's combined system was a logical choice for early planners. The topography is hilly and, in places, difficult to excavate. Of course, this means the treatment plants get increased loads during the rainy season.

"Hard to say just how much the impact is," Forth explains, "since the rain can be pretty localized and where it goes depends on the topography, but there's a lot of it that ends up in our system."

All PPSD plants are fully metered. Forth provided representative numbers for their Hurricane plant: October saw 2.78 inches of rain and the meters clocked 10,633,271 gallons input. Customer usage was 9,273,398 gallons. That means they had 1,359,873 gallons infiltration, or 12 percent. In September, that number was 9.1 percent. PPSD sees similar variations across (continued) Tom Forth, foreman of Maintenance and Construction at the Putnam Public Service District, on the job in Scott Depot, West Virginia. (Photography by Sam Owens)

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Top: Putnam Public Service District maintenance crew member Jeremiah Campbell applies grout to a manhole wall at Scary Creek Industrial Park in Scott Depot, West Virginia. Above: Tom Forth pumps grout through the Pro 50 Starter (Parson Environmental Products) grout pump and spray machine while his crew sprays the inside of a manhole.

their whole system.

When PPSD sees a spike in one area, they follow up with an inspection crew that looks at every manhole and checks for cross connections. With all assets now mapped in GIS, the crew can quickly diagnose the problem. Since PPSD started their manhole rehab program, they've seen significant reductions in I&I.

Cross connections are another issue. Residences and businesses are reasonably compliant with guidelines for diverting runoff, but violations are ongoing. The usual notification protocols are attempted before fines are issued.

"We've got a whole lot of that," says Forth. "And we've got a program to deal with it. Our inspectors always catch it. If we find a manhole with unusually full flow we video the pipes to find the cause. If it's I&I in our own pipes, we fix it. If it's not, we do a smoke test. That's how we find the violations and that's when the letters go out."

#### Hydrogen sulfide problems

Some of the 5,800 manholes in PPSD's system are pushing 50 years old and are made from materials susceptible to corrosion. They've added some new manholes as needed for growth, but the old ones are nearing the end of their design life. Aging is accelerated by aerobic bacteria called Thiobacillus concretivoru. Those bugs will "eat" hydrogen sulfide, excreting sulfuric acid in the process.

"All the hydrogen sulfide in our system comes from waste," Forth explains. "The soils here are low in sulfates, so there's no contribution from I&I. We find some damage in our lifts and pipes, but the worst is where force mains

(continued)

#### **PROFILE:** Putnam (West Virginia) **Public Service District** Sewer System

SERVICE AREA: 19 square miles (in Putnam County, West Virginia)

**CUSTOMERS:** 10,558 residential, 560 commercial

POPULATION DENSITY: 162 per square mile

#### INFRASTRUCTURE:

270 miles of mains, mix of asbestos cement, ductile iron, PVC and terracotta, diameters 4-16 inches; 74 lift stations (5-25 hp); 5,800 manholes (concrete, brick, cinderblock); 350 E/One grinders; 5 treatment plants (2 of their own, 350,000 and 325,000 gpd capacities, 3 additional plants under contract)

#### EQUIPMENT:

CUES sewer cam, SEA 747 trailer jet, CUES sewer cam, SEA /4/ trailer jet, 6 portable and 19 stationary 240/ 480VAC generators, portable grout pump, no-dig pipe patch equipment, F-650 single-axle dump, F-550 mechan-ics truck, F-350 single-axle dump, F-350 maintenance truck, GMC 3500 sewer maintenance truck, Case 4x4 rubber tire hoe, Kubota 121 track hoe, Kubota U45 track hoe

#### ANNUAL BUDGET:

\$302,000 capital, \$7.34 million operational

EMPLOYEES:

#### **AVERAGE PRECIPITATION:**

55 inches per year (41 rain, 14 snow)

#### SOIL TYPE:

Highly varied: sand, clay, shale, rock, river-bottom soil with an elevation change of 441 feet (640-1,081 feet)

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enter manholes. We had some where the main was delivering 1,200 to 1,400 gpm, and they were in bad shape.

"That generates a lot of turbulence and mixing and brings oxygen to the bacteria, helping them grow. So we keep an eye on those manholes, inspecting them regularly and prioritizing them for rehab work."

Not all repairs are related to hydrogen sulfide. Some of the oldest manholes are made of materials structurally weaker than concrete, and they can contribute to I&I even without corrosion.

### Hydrogen sulfide solutions

"We went with a manhole lining system based on calcium aluminate cement," notes Forth. "It had one of the best ratings for resistance to corrosion. So the first 11 manholes were subbed out. When I watched the process, with my construction experience I knew we could do that in-house. So I went to my boss and he gave me the green flag."

What they got was an increase in speed and a decrease in cost. When they subbed out that job they were paying about \$300 per foot. When they tried it in-house applying the lining by hand, that cost dropped to \$177 per foot. But it was difficult work, with the 13 manholes they tackled ranging from 8 to 14 feet deep.

"That work nearly killed us," recalls Forth laughing. "So I started some research and decided to buy that grout pump from Parson Environmental. It got our cost down to around \$130 to \$140 per foot."

Doing as much rehab work as possible inhouse saves time and money. "That wasn't a tough decision," Forth proudly observes. "We've got a good fleet and the right equipment. Plus our guys can do the job. Bottom line is it keeps our costs

#### SELF-HEALING CONCRETE

The Putnam Public Service District has found ways to deal with its hydrogen sulfide problems, but there's a new development taking shape in the Netherlands that may reshape how other utilities handle the problem.

Dr. Henk Jonkers, a microbiologist working at Delft University of Technology, is developing a special blend of concrete that when cracked or corroded can actually repair itself. The product promises a huge increase in the service life of concrete, whether in buildings, bridges or wastewater systems. But it's not an additive or coating — it's a blend of concrete with embedded bacteria that can fill cracks and pits as they form.

"I was inspired by the way the human body can repair itself, and I started thinking about how that same ability could be transferred to structural materials," Jonkers says. His research eventually led to a unique mix of organics and inorganics.

Many types of living organisms are capable of producing structural materials — from human bone to coral reefs to the calcium carbonate excretions of certain bacteria. Bacteria can remain dormant for long periods, deprived of light and water, so they were good candidates for further investigation. Concrete has a high pH when liquid (11-13), so what was needed was a bacterium that not only excreted calcium carbonate but could also tolerate an alkaline environment. Additionally, it had to be a sporeproducing bacterium.

The bacteria Jonkers chose are dormant *Bacillus* and/or *Sporosarcina*, contained in pellets with a food source (calcium lactate). The pellets are produced as a fine powder that is mixed into the concrete before pouring. These bacteria will remain dormant but viable until needed. When a crack or pit forms, something amazing happens.

Water seeps in and reactivates the bacteria. They eat the food and excrete a hard calcium carbonate (CaCO3) filler, essentially organically generated limestone. This seals the breach and prevents water from reaching the rebar. Rebar expands when it rusts and can cause additional cracks that compromise structural integrity.

In the case of sewer pipes, lift stations and manholes, bacteria cause damage by excreting sulfuric acid metabolized from hydrogen sulfide. The acid forms pits in the exposed surface of the concrete. As the pits grow, the structure eventually fails.

If the concrete is Jonkers' blend, those pits would be sealed with limestone. It's not a permanent fix, since limestone is also dissolved by sulfuric acid. But the concrete will last far longer before succumbing to structural failure. and rates low. In fact, we've got one of the lowest rates for utilities in this region."

The utility has relined 31 manholes to date and is on a one-per-week schedule (when weather permits). "We've also done 2,462 inspections and 668 repairs in addition to those 31 relines," Forth adds. "For damaged pipes we use the Source One Environmental pipe patch system. It's a no-dig CIPP process and can even get into the laterals."

#### **Dealing with growth**

According to the Putnam County COC, the local population continues to increase by about 300 residents each year. Some settle in smaller municipalities with independent sewer systems. Still, within PPSD's service area, development requires system expansion. And, unrelated to growth, some lines have been extended to provide remote customers with sewer and water service and take them off wells and septic systems.

"We just completed a \$16 million extension to bring in two rural areas," Forth says. "And Poca sold us their sewer. They gave up on it and contracted us to do it for them. That added 920 manholes to our system. We still need to do some upgrades on their stations, so it's a work in progress over there."

PPSD also extended lines to outside Putnam County and now provides service for parts of St. Albans to the south and Culloden to the west. Another in-county extension added Buffalo on their northern boundary.

As a nonprofit public service district to the state, PPSD relies on sewer and water fees for most of their \$7.34 million operational budget. Customers can access a convenient online payment gateway for a variety of options. For larger capital projects, federal and state money is available. It must be repaid, but the interest rates are low.

#### **Keys to success**

PPSD has won many water-quality awards since 2006: seven from agencies in West Virginia, and three from regional and national organizations. Several have been repeats over consecutive years. Multiple factors contributed to this recognition.

"For those water-quality awards, we had automated our treatment plant in 2006. We also built a new sediment basin to increase our capacity to 4 million gpd," Forth explains. "We built a 600-million-gallon reservoir back in the '90s, and it's far enough upstream that it gets the really good water."

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Environment One Corporation 518/346-6161 www.eone.com the Kanawha River, a tributary of the Ohio. Discharges are monitored closely with reports to the state and EPA sent quarterly. Since 2006, PPSD has consistently met all state and EPA standards.

Forth says there are many factors involved in the utility's success. "We've got pretty good staff retention, so they know their jobs and are all hard workers committed to our mission. We've got permanent crews for specific tasks so they work as a team, but most are cross-trained. And we've got the equipment we need."

Forth has been with PPSD for 11 years and worked in the bridge construction industry before

that. He brings his production-oriented project management experience to the job, as well as excellent problem-solving skills. And with his construction experience, he's got a good intuition for what can or cannot be done out in the field.

"I have to add that we have the support of an extremely receptive administration and Board of Commissioners," Forth says. "Mike McNulty (PPSD manager) gets us whatever we need to fix the problem. And the board just built us a new maintenance facility for around \$1.5 million. That makes us all feel appreciated." ◆

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TH	Technical Services Inc Technical Services Inc He SINGLE/SOLUTION See ad page 17	<b>RS Technical Services, Inc.</b> 1327 Clegg St., Petaluma, CA 94954 Toll Free: 800-767-1974 • Phone: 707-778-1974 • Fax: 707-769-8806 www.rstechserv.com • sales.info@rstechserv.com	R.S. Technical Services, Inc.	2" to 200"	150' to 2500'	HDD Flash Drive/USB Thumb Drive SD Card Compact Flash DVR CD DVD VHS	YES	YES	YES	YES	YES	YES
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## **BETTER MOUSETRAPS**



Michigan utility efficiently clears hundreds of cubic yards of grease from a 42-inch trunk line By Sheila Joy

Below the streets of Livonia, Michigan, a massive and growing volume of FOG threatened to disrupt a thriving industrial corridor. The local wastewater utility needed an immediate solution. Livonia is a carefully planned community of residential, industrial, commercial and civic development with a population of approximately 100,000. Centrally located between Detroit and Ann Arbor at the intersection of two major freeways — I-96, which travels east and west, and I-275, which travels north and south — the city's ease of access has a strong appeal.



A 6-mile corridor containing more than 32 million square feet of manufacturing space and 4 million square feet of office space is home to a variety of industrial companies. With annual household income levels 33 percent above the national average, Livonia is also an excellent place for retail, dining and entertainment.

Vibrant and active communities like Livonia have to be especially proactive when it comes to maintaining underground infrastructure due to heavy demand. As a result, Livonia's Public Works Department regularly assesses and cleans sewer lines to ensure the highest levels of flow to keep the city productive and healthy.

#### "I have been cleaning pipes and removing grease for a number of years and I have never seen anything like this."

#### -David Guth

During a recent inspection of the city's collections system by United Resource, a Livonia-based company that cleans and televises sewer lines, an isolated area that had accumulated significant grease was identified. "We inspected half a million feet of pipe and were able to videotape about 70 percent of the lines without incident," says David Guth, president and founder of United Resource. "We did find one area, however, that had accumulated a significant amount of grease that would require removal in order for the inspection to be completed."

The area identified was a section of 42-inch trunk line that runs from one end of the city's border to the other. Located along the busy I-96 corridor, the line collects waste from industries and businesses from all directions. Guth estimated the 2-mile stretch of the 42-inch pipe contained hundreds of cubic yards of grease.

"We saw the inspection photos and knew that we needed to act right away to preserve the integrity of our pipes," says Don Rohraff, Livonia's director of Public Works. "It appeared to be a very large volume of grease



in what we know to also be a very high-flow pipe."

Along with its finding, United Resource presented the city with an innovative solution to remove the grease while minimizing cost and disruption.

"We had worked with Duke's Root Control on a number of projects over the years, including a large root control project at Michigan State University," Guth says. "I knew how effectively their products killed roots in sewer systems, so I wanted to find out if they had any products that could help with grease. I reached out to Bob Hunn and he told me about JetPower II from Duke's Sales and Service. He provided case studies of how well it worked for other cities, so we decided to recommend it to Livonia to treat this isolated area."

City officials were familiar with the product and approved the recommendation on the spot. Rohraff says they wanted to remove the grease immediately to eliminate the possibility of further inconvenience to residents and businesses. United Resource went to work right away.

"You only need 1 percent of JetPower II for every gallon of water," Guth says. "For this job we used a 4,000-gallon water tanker, which meant we only needed 40 gallons of JetPower II. We agitated the water and JetPower II inside of a water truck for about 15 minutes to get a good mix. Then we pumped the mixture into our jet/vac truck.

"From there, the mixture entered the pipe with a rotating-type nozzle that sprayed the degreaser, which was applied at a uniform rate from manhole to manhole. When we got to the end of the run, we shut it all down for 10 to 15 minutes, and then turned everything back on, spraying as we pulled back.

"Almost immediately we saw that the grease was liquefying, turning into a substance that we could pump," Guth adds. "We treated the entire 2-mile area. I went back the next day and the JetPower II had restored flow capacity. The grease was gone. The manholes that were once surcharged and holding water were now working properly. The best part is that JetPower II contains chemical agents that surround the dissolved grease particles, so once the liquid grease is washed downstream, it doesn't re-coagulate. I have been cleaning pipes and removing grease for a number of years and I have never seen anything like this."

Livonia's innovation and ability to address a potential problem before it affected the local industries, businesses and residents — saved the city close to \$100,000 worth of heavy cleaning and bypass pumping. In addition to direct costs, traditional cleaning and removal of grease would have also contributed to other expenses and issues, including traffic control, equipment and manpower. Instead, United Resource's recommendation to use JetPower II and Livonia's proactive and innovative thinking saved the city both time and money that can be utilized elsewhere.  $\blacklozenge$  Jack and Jill Need water still But buckets get too rusty And now they see That FRP Is something much more trusty.

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## TAKING THE STRESS OUT OF TESTING

Greensboro Water Resources develops pilot program to test aging prestressed concrete water mains

#### By Peter Kenter

The City of Greensboro, North Carolina, emphasizes growth and economic development to benefit its population of 250,000. The city's Water Resources department, with responsibility for water and wastewater infrastructure, is part of that effort. Developing a pilot program to effectively inspect prestressed concrete cylinder pipe water main is just one way in which the department strives to create value for the city.

Water Resources engineer Melinda King is part of a group that performs feasibility studies and plans reviews for developers and other customers (see sidebar). The department also collects information on the condition of water and wastewater systems and devises testing protocols for infrastructure.

"Parts of both our water and wastewater systems date back to the late 1880s, with the vast majority being installed from the 1940s through the 1960s as part of growth related to the post-World War II baby boom," King says.

Water pipe installed prior to the 1970s is typically cast iron while later installations also include ductile iron and PCCP. Ductile iron and PVC are the generally preferred materials for replacement. Older sewer pipe primarily includes vitrified clay with some cast iron. New installations generally use PVC and ductile iron.

#### **Robust rehab**

"For a system the size of Greensboro's, we rate both water and wastewater infrastructure as being in moderately good condition," King says. "We maintain a very robust rehabilitation and replacement program for both our sewer and water pipes."

The sewer rehab program has been funded continually since 1998 and the water rehab pro-*(continued)*  Greensboro Water Resources crew member uses a Komatsu excavator to dig down to ade for the installation of new sewer line on the City of Greensboro Water Resources' nwood Lakes project. (Photography by Al Drago)



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www.ariesindustries.com (800) 234-7205 "It's challenging to design a gravity sewer around a lake, and some of the sewer pipe is buried as deep as 40 feet with one section going underneath the lake."

- Melinda King

Workman Zachary Seals covers a temporar stream crossing set up to block water from entering the construction site on the edge o the Lynwood Lakes project.

gram since 2008.

"The department has made a commitment to have these programs funded at a level of 1 percent of system footage to be rehabilitated and/ or replaced per year by 2020," says King. "These programs consistently achieve prices that are generally below the national average, allowing more footage to be rehabilitated for every dollar spent."

Most work is contracted out. Water pipes have been replaced using directional drilling and pipe bursting, and rehabilitated with internal epoxy spray pipe lining. Techniques employed for sewer pipe renewal include directional drilling, pipe bursting, slip lining and cured-in-place pipe lining.

The city owns an impressive fleet of maintenance equipment, including six combination trucks (four Vactors and two Vac-Cons), two power rodders by Sewer Equipment Co. of America, and two CUES camera trucks.

"We perform all sewer cleaning services inhouse and do CCTV inspections on all areas of the system requiring maintenance work," King says. "We outsource all CCTV work related to potential rehabilitation or resurfacing on a basinby-basin basis."

Leak detection is also performed in-house using acoustic listening devices and correlators from Echologics.

The city incorporates GIS data on infrastructure using ArcGIS by Esri. The process of incorporating existing GIS infrastructure data has been largely completed. "We're still trying to collect full information on some of the infrastructure built 100 years ago or more," King says. "However, when operation crews receive a work order and find something that is not correct, they inform the mapping division through a work order. The mapping department then goes out and uses Trimble tablets to correct the data."

#### System expansion

The department remains committed to new construction as well, including several major system expansion projects.

Current major work includes an extensive \$22.5 million water and sewer project for the Greensboro-Randolph Megasite, a parcel of land seen as critical for economic development. Required infrastructure includes approximately 87,900 feet of 16-inch water main, 42,700 feet of 16-inch force main, and a 1 to 1.5 mgd sewer lift station.

Another region the city has recognized as a potential growth area is eastern Guilford County. The city will upgrade an existing lift station to increase its capacity to 3,000 gpm. Additional construction will include a new 6,000 gpm pump station, 24,000 feet of 30-inch water main, 12,800 feet of 18-inch water main, 11,200 feet of 42-inch water main, and 12,000 feet of 36-inch gravity sewer.

Additionally, the Lynwood Lakes water and sewer project involves construction of approximately 26,000 feet of waterline and 30,000 feet of sanitary sewer line to serve 300 residences in Guilford County.

"Lynwood Lakes is a complex project that involves a lake and an existing neighborhood," King says. "It's challenging to design a gravity sewer around a lake, and some of the sewer pipe is buried as deep as 40 feet with one section going underneath the lake. On this project we're using traditional jack and bore drilling, blasting and hand tunneling."

#### PROFILE: City of Greensboro (North Carolina) Water Resources

YEAR ESTABLISHED: 1837

CUSTOMERS SERVED: 104,000

AREA SERVED: 131 square miles

**DEPARTMENT STAFF:** 344

INFRASTRUCTURE: Sewer: 1,416 miles; Water: 1,490 miles

ANNUAL DEPARTMENT OPERATING BUDGET (2015-16): Sewer and water: \$96.4 million; Stormwater: \$6.6 million

#### **ASSOCIATIONS:**

American Public Works Association, American Water Works Association, Water Resources Research Institute, National Association of Clean Water Agencies, North Carolina American Water Works Association & Water Environment Federation, North Carolina Water Quality Association, North Carolina Pretreatment Consortium, Cape Fear River Assembly, Upper Cape Fear River Basin Association

WEBSITE:

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Left: Melinda King, project manager for the City of Greensboro Water Resources' Lynwood Lakes project, on site in Greensboro, North Carolina. The \$9.8 million project includes 26,000 feet of waterline and 30,000 feet of sanitary sewer line to serve 300 residences. Right: Workman Ed Davis uses a level to make sure a new section of pipe is set at the proper grade.

#### **Preparing an inspection pilot**

The department has also been hard at work with a pilot project designed to accurately test the condition of PCCP water mains, in particular the prestressed wire in the pipe, which is vulnerable to corrosion and hydrogen embrittlement.

The department chose a one-two punch with two condition assessment tools, both supplied by Pure Technologies. The first is PipeDiver, a freeswimming inline tool that uses remote field eddy current/transformer coupling (RFEC/TC) technology to electromagnetically identify breaks in prestressed wires along the entire length of a PCCP main. The second is SmartBall, another free-swimming tool that records information on leaks and air or gas pockets inside a pipe.

"By first developing a pilot methodology, we could determine whether a full-scale test would provide accuracy and ratepayer value," King says. "Our primary testing target is the 19,000-foot Bryan Park Water Main, a 36-inch PCCP transmission main out of our Townsend Water Treatment Plant. That main had previously experienced a failure along a joint. Before a full-scale inspection, we wanted to judge the effectiveness of our inspection tools and gauge the difficulty associated with the inspection effort — and ultimately determine whether a full-scale test was warranted."

Standing in for the Bryan Park Water Main was the Bridge Point Water Main, a 2,000-foot length of 30-inch PCCP main with few residential customers. This water main could be temporarily isolated and depressurized with little to no interruption of service in case of a problem during inspection.

#### **Relying on in-house crews**

The in-house project was completed without

the use of outside construction contractors and employed only city crews. The project methodology was designed by engineering consulting firm Brown and Caldwell. The engineering firm brought in representatives of Pure Technologies to assist with the pilot.

By selectively opening three hydrants, the water velocity of the pipe was adjusted to accommodate the requirements of the inspection tools. Acoustic sensors allowed crews to track the devices so they could be retrieved at the extraction point.

City staff installed 16-inch tapping sleeves and valves to provide access at the inspection tool insertion and extraction sites. The 16-inch pipe coupons and prestressed wires from the taps were collected by crews to provide a benchmark for use in the pipe evaluation.

"The SmartBall inspection detected no leaks or gas pockets in the Bridge Point main," King says. "PipeDiver revealed five areas of wire break zones in four of the 110 16-foot pipe sticks that make up the length of the main."

PipeDiver can detect a minimum of five broken wires in one location. The number of wire breaks detected per zone ranged between five and 10.

"At an estimated pressure of 140 psi, it was determined by the engineers that pipe sticks containing more than 24 broken wires would represent a distressed pipe," King says. "Sticks containing 10 or fewer broken wires represented a low level of distress."

#### Joint inspection spurs repairs

Of the six pipe joints exposed and inspected, four required minor mortar repairs, while a fifth required major mortar repairs. In a sixth, the mortar had failed, exposing the steel in the joint to soil and moisture, with inspectors noting that corrosion of the steel in the joint would eventually lead to a leak or failure of the pipe.

"We found nothing that couldn't be repaired," King says. "But the pilot inspection has changed both our inspection protocol and our approach to Bryan Park planned for May 2017. Based on our results, we're moving to PCCP inspections every five years. Because we'll be moving to repeat inspections, we will also be installing permanent insertion and extraction points at Bryan Park possibly one vault and a direct-bury point that can easily be dug up."

Given the results of Bridge Point, the Bryan Park project will also be focusing more heavily



#### DATA FOR DEVELOPMENT

Businesses thrive on accurate development data. That's why the City of Greensboro Water Resources is committed to providing developers and other customers with accurate cost projections on connecting with the city's water and wastewater services. Water Resources engineer Melinda King is part of the group that provides feasibility studies and plan reviews.

"We strive to assist our customers with moving forward on their business plans as part of a commitment to developer-friendly coordination," says King. "If they provide us with the appropriate data, we will create anything from a sketch plan review to a feasibility study that provides them with a probable cost to extend water and sewer services to their site." As a self-permitting agency, Greensboro Water Resources has developed an agreement with the State of North Carolina to grant permits to developers, depending on the complexity of the plan.

"The COGWR is a delegated authority for the North Carolina Division of Water Resources, so providing there are no variances from state regulations, we can permit sewer and water services through plan review," says King. "In most cases, our standards are higher than those required by the state."

King's department also works to incorporate new sewer and water developments into its infrastructure database.

"Once construction is complete, the developer submits survey grade information and my group collects the GIS information and incorporates it into the database of known sewer and water infrastructure," she says. "We take the information full circle from plan review to completed construction."

on joint inspections, King says. "By performing the pilot inspection, we know our full-scale inspection will be more effective and demonstrate that we are good stewards of the funds that we're entrusted with."

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Attacking the competition and creating negative perceptions can ultimately slow the growth of trenchless technologies

#### By Ted DeBoda, P.E.

For the past 40 years, NASSCO has been successful in setting standards for the assessment and rehabilitation of underground infrastructure because — in the words of one of our board members — "people put down their swords" when it comes to NASSCO members working together and doing what is best for the industry.

Every NASSCO member has signed a pledge that states, "Our integrity, ethics and technical competence are the source of our strength. They provide the industry's corporate intelligence and determine its reputation." For the most part, our members uphold this pledge; however, our industry — which includes NASSCO member organizations — is not immune to the effects of negative selling.

Marketing communications and other sales tactics that attack the competition or create negative perceptions of competing products can creep in and ultimately slow the growth of trenchless technologies by undermining the confidence of municipalities and engineers.

Many engineers and municipalities are still not completely comfortable with trenchless technologies. After listening to salespeople share negative views of competitive products, engineers may conclude that no trenchless solutions are worth the risk and place their trust on the reliability of opencut repairs and replacement, which ultimately hurts us all.

No products or services are perfect for every application. The decision of what is best for any trenchless project should be based on a firm understanding of each of the products or services available, engineering facts regarding these products and services, and references from independent sources.

Our industry relies on the cooperation of competitors to build and grow the industry for everyone. This is an effective recipe that has been extremely successful for 40 years. Unfortunately, when one company decides to falsely represent the competition, this can upset the balance. Not only do they shed a negative light on their competitors, they shed a negative light on their own company, and ultimately the trenchless industry in general.

NASSCO's mission to ensure the continued acceptance and growth of trenchless technologies goes way beyond the success of our members. It represents more cost-effective sustainment of our infrastructure, more effective spending of our sewer and water fees, and, ultimately, healthier infrastructures for our communities.  $\blacklozenge$ 

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#### By Craig Mandli

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The Universal Roller Skid (URS) from CPI Products helps increase the effectiveness and life span of a portable video inspection system. The device's ability to contract and expand for use in 6- to 18-inch pipelines allow the use of a portable video inspection system in applications that previously required tractor systems. It allows inspection cameras to negotiate multiple corners and bends and increases the depth range significantly. It accepts most standard push cameras under 2 inches in diameter. It is constructed of lightweight, durable, corrosion-resistant composite nylon. 413/443-0925; www.cplas.com.

#### 7. Vanguard Pathogen Defense System

The Vanguard Pathogen Defense System for CCTV trucks helps protect workers' health by blasting off dangerous pathogens at the source before pulling them into the vehicle. The on-demand antibacterial injection feature allows the operator the choice of cleaning with pure water or water containing a germ-killing antibacterial at the touch of a button. The system's spray roller is Y-shaped to allow for easy access of CCTV equipment into and out of the manhole. The water-economizing spray roller is designed to remove debris off the cable as it passes over the roller, helping keep pathogens in the sewer out of the mobile office. The system includes a 35-foot high-pressure hose reel and spray gun for efficient cleanup of the work area, as well as boots, gloves, tools and other equipment contaminated with raw sewage. 800/781-3164; www.vanguard-systems.com.

#### LASER PROFILING EQUIPMENT

#### 8. Envirosight ROVVER X laser profiling attachment

Attaching in seconds to the ROVVER X inspection crawler, the laser profiling attachment from **Envirosight** geometrically profiles the inside of pipes. Captured profile data is readily analyzed to verify proper pipe installation, plan relining projects, determine remaining pipe life, monitor erosion/corrosion, quantify defects, and analyze partial collapses. It attaches without tools and requires no electrical connections. A hinged mounting system makes it easy to deploy in tight spaces, and twin carbon fiber arms ensure extra rigidity. It profiles lines up to 18 inches in diameter when mounted directly to the ROVVER X crawler. Larger lines are addressed by mounting the accessory to a skid that is pulled by the crawler. Profile data can be transferred seamlessly to WinCan inspection software, the laser module that can trend diameter and deformation frame-by-frame to generate a solid model, ovality graph or color plot. It can be mounted to any ROV-VER X pan/tilt/zoom camera. **866/936-8476; www.envirosight.com.** 

#### 9. RauschUSA KSI35 Scan

The **KS135 Scan** laser profiler from **RauschUSA** has two laser diodes integrated into a mainline TV camera head that projects lasers onto the pipe wall. It is designed to perform three tasks in one complete system: CCTV inspection, crack measurement and laser profiling. No lengthy, manual field calibration is necessary – simply place the profiler in the pipe and begin instantly. As it travels through the pipeline, it performs conventional CCTV inspection while taking highly accurate joint and crack measurements using the integrated laser diodes. On the return trip to the manhole, the rotating camera head analyzes the pipe profile via spinning laser technology. All data is instantly and accurately generated on site using POSM software. It can be used in pipe 6 to 48 inches in diameter. **717/709-1005; www.rauschusa.com.** 

#### 10. Topcon Positioning Systems TP-L5 Series

**TP-L5 Series** of laser profilers from **Topcon Positioning Systems** includes five models. With up to four times the visibility of a red beam, GreenBeam models are designed to provide an ideal solution for long-run pipelines and areas where ambient light is common. They have an improved operating panel with a high-contrast display for visibility in all lighting conditions. All models also benefit from improved battery life, with up to 20 percent extended operating time. Three green and two red beam choices are available. They provide vertical alignment beams and SmartLine automatic target alignment. All offer a wide grade range from 15 to 40 percent grade, fully automatic self-leveling, a rugged metal housing, the option of interchangeable rechargeable or alkaline battery packs, and an IPX8 waterproof rating. **925/245-8300; www.topconpositioning.com.** 

(continued)



#### LOCATORS

#### II. General Pipe Cleaners Gen-Eye Hot Spot

The **Gen-Eye Hot Spot** pipe locator from **General Pipe Cleaners** includes a total field antenna array and on-screen icons to lead the operator to the target without a long learning curve. It can help quickly locate inspection cameras, sondes, active power lines and utility lines with pinpoint accuracy. The easy-to-see auto backlit LCD display shows the way with arrows that point in the right direction. The null icon indicates the pipe location and the camera icon confirms when the locator is over the target. To locate utility lines, circle the energized pipe or tracer wire until the utility icon appears on the screen. Rated at IP65, it's dust- and dirt-proof, and water-resistant. It has passed the 1-meter drop test, while the screen passed an 18-inch steel ball drop test. It locates two sonde frequencies, two power frequencies and four line frequencies, and the USB port can be used in the field to upgrade software. **800/245-6200; www.drainbrain.com.** 

#### 12. Radiodetection Corporation RD8100

The **RD8100** cable and pipe locator from **Radiodetection Corporation** has a unique arrangement of five antennas with optional integrated GPS and usage logging, keeping users on the right line while enabling them to demonstrate safe working practices and validate quality of work. It has integrated, automatic GPS and usage-logging options. By analyzing usage patterns, users and management can assess individual locate operations to ensure compliance with best practices, or to identify training needs. The data can be used for internal audits or shared with customers to conform task completion. **877/247-3797; www.radiodetection.com.** 

#### 13. RIDGID SeekTech SR-24 Line Locator

The **SeekTech SR-24 Line Locator** paired with the RIDGIDtrax app from **RIDGID** simplifies locating jobs and streamlines the creation of accurate maps of underground utilities to protect critical assets. The SR-24 is a locating receiver that uses integrated Bluetooth communications to transmit data to an onboard microSD card or third-party survey-grade GPS or mobile device. Its omnidirectional antennas capture the complete signal field, making it easy to locate a line and follow its path. Connecting it to RIDGIDtrax allows for creation of visual maps of underground utilities using a phone or tablet. Multiple lines can be traced, color coded and named on an overhead satellite image of a job site. The unit weighs 3 1/2 pounds, has a battery life of 16 hours and wireless range of 200 yards, and can be programmed to detect any active frequency from 10 Hz to 35 kHz. **800/769-7743; www.ridgid.com.** 

#### 14. SubSurface Instruments AML PRO and AML+ Series

AML PRO and AML+ Series all-material locators from SubSurface Instruments use ultra-high radio frequencies to find differences in subsurface densities for locating PVC and PE pipes and nearly any other subsurface object that has an edge. They will locate subsurface materials indiscriminately, including plastic, metal, wood, cable or pipe, and work in clay, wet soil, snow or even standing water. They have a durable ABS housing, advanced microprocessor, USB and headphone connectivity, and a variety of sensitivity levels. 855/422-6346; www.ssilocators.com.

#### 15. SubSurface Locators LD-18

The **LD-18** digital water leak detector from **SubSurface Locators** reduces ambient, intermittent noises from dogs barking, cars passing by, footsteps and people talking. Its digital electronics sample the sounds every few thousandths of a second, and if it detects an intermittent sound, it suppresses it instantly. Water leak sounds are almost always continuous noises, and the unit can identify continuous leak sounds even in difficult conditions, like busy streets. **775/298-2701; www.subsurfaceleak.com**.

#### 16. Vivax-Metrotech vScan Utility Avoidance Tool

The vScan Utility Avoidance Tool from Vivax-Metrotech makes buried utility detection a simple and cost-effective process. Dual active frequencies, together with power and radio modes, ensure the maximum detection rate. Alerts and alarms can be configured to encourage correct usage. Seamless data logging helps identify training needs and, with the optional GPS, enables mapping features. A compass line direction indicator is included, and optional features such as GPS, BT and a buried metal cover mode are also available. An integrated self-test/calibration facility ensures the unit is fit for use at any time. 800/446-3392; www.vivax-metrotech.com.



#### MAINLINE TV CAMERA SYSTEMS

#### 17. Amazing Machinery Viztrac Max

The **Viztrac Max** camera from **Amazing Machinery** has the same durability and super slick push cable as previous Viztrac cameras, with a 22 percent larger 9-inch LCD color display, and a rechargeable lithium-ion battery pack capable of up to eight hours of field use before recharge. The unit includes an AC/DC adapter for direct power supply, a 512 Hz sonde transmitter, and a DVR recorder that records to a standard SD card. A 4GB card is included. **800/504-7435; www.amazingmachinery.com.** 

#### 18. Aries WiperCam Pan & Tilt

The **WiperCam Pan & Tilt** inspection camera from **Aries Industries** provides increased productivity with a mainline in-the-pipe lens cleaning system. The maintenance-free camera with field-replaceable wipers results in more time in the pipe. A clean lens ensures clear images for fast, accurate assessments in 6-inch-diameter or larger pipes. The lens is cleaned as the camera rotates across the wiper blades. The operator can return to productive inspections seconds after cleaning. Pan-and-tilt camera head rotation provides a 300-degree viewing angle, allowing viewing of lateral connections while conducting mainline inspections. The camera is ultra-sensitive (1.0 lux), with an efficient LED lighting system. Evenly spaced LEDs provide consistent illumination throughout the pipe diameter. A 40x zoom capability captures fine detail. **800/234-7205; www.ariesindustries.com.** 

#### 19. CUES mainline TV camera system

**CUES** offers custom truck-mounted systems for CCTV inspection, mainline and lateral service grouting, pipe profiling and lateral reinstatement requirements. Made to withstand severe conditions and ergonomically designed for comfort and efficiency, CUES truck-mounted systems offer a high return on investment. The truck chassis can be specified to contain all or any combination of the aforementioned equipment. **800/327-7791;** www.cuesinc.com.

#### 20. Electric Eel Ecam PRO 2

The **Ecam PRO 2** from **Electric Eel** allows technicians to quickly inspect 3- to 10-inch pipelines. It includes a stainless-steel-housed 1.68-inch-diameter self-leveling color camera with sapphire lens, 20-LED light ring and high-resolution CCD element. A flexible camera spring navigates 3-inch P-traps. The auto iris adjusts lighting automatically. The unit comes standard with 200 feet of Kevlar-braided 1/2-inch-diameter pushrod, industry-standard 512 Hz sonde, 10.4-inch daylight-readable monitor with click-touch controls, and one-touch recording directly to a USB flash drive. It has an on-screen footage counter, a two-hour battery with built-in charger, adjustable light controls, 16 pages of text writing with memory saves, voiceover recording, an 8x zoom function, audio/video out jacks, 8-inch wheels for easy maneuverability, a secure-locking reel brake, and powder-coated steel tube and bar construction. **800/833-1212; www.electriceel.com.** 

#### 21. Hathorn Corporation Wi-Fi lateral inspection camera

The Wi-Fi lateral inspection camera system from **Hathorn Corporation** comes with 200 feet of pushrod attached to a slim 1.4-inch self-leveling camera head, 512 Hz sonde transmitter and a rechargeable lithium-ion battery pack. It has an on-screen footage counter and adjustable lighting controls and can record video and take snapshots up to 200 feet away on any type of tablet or mobile device with a custom mobile app. Recorded files can be emailed or downloaded straight to a computer. The system allows users to recharge their mobile devices directly from the control unit. **905/604-7040;** www.hathorncorp.com.

#### 22. KEG Technologies KleenSight

The **KleenSight** camera nozzle from **KEG Technologies** can clean and inspect sewer mains in one pass. The 1080P HD self-leveling camera ensures a high-quality video for clear condition assessment. Videos can be emailed or sent to the cloud to share with co-workers or customers. A high-performance nozzle is used to propel the camera nozzle and also clean the line, eliminating the need to pre-clean. Video is recorded to a 16GB internal memory, where it is stored until the memory is full and the files are written over. Any Wi-Fi-capable device can access and download the data when the KleenSight is set to Wi-Fi mode. The system is designed to work with existing flush and camera trucks, and the MPEG 4 format videos are compatible with most software currently on the market today. **866/595-0515;** www.kegtechnologies.net.



#### 23. Spartan Tool SparVision 200

At 25 pounds, the **Sparvision 200** pipe inspection camera from **Spartan Tool** is self-contained for easy on-the-job maneuverability. Outfitted with iPad Air or Samsung Galaxy S10 technology, it is intuitive to use yet packed with features such as telestration where you actually draw on the screen to indicate problems, Wi-Fi for freedom of movement and simple emailing of video, and even a full on-screen QWERTY keyboard. Its 200 feet of ultra-slick pushrod will hurry through the drain, and the self-leveling camera head simplifies diagnosis. It provides instant snapshots, and comes with a standard 512 Hz locating beacon and distance counter. **800/435-3866; www.spartantool.com.** 

#### MAPPING

#### 24. IBAK 3D-GeoSense system

The **3D-GeoSense** system from **IBAK** uses a sensor in the camera to provide users with a 3-D map of the lateral. The XYZ coordinates can be determined when the camera is moving both forward and backward, immediately providing the operator a real-life site plan with the width, length and elevation data of the lateral being inspected. It can be used in push or lateral launch applications. Additional third-party software is required. **800/656-4225; www.rapidview.com.** 

#### **RECORDING/ARCHIVING/DATA DEVICES**

#### 25. InfoSense SL-DOG

The **Sewer Line Data OrGanizer**, or **SL-DOG**, from **InfoSense**, provides data downloading, cloud management and visualization support for the Sewer Line Rapid Assessment Tool, or SL-RAT. The SL-RAT uses active acoustics to provide a fast assessment of blockage conditions in gravity-fed sewers to focus sewer cleaning and CCTV inspection efforts. The software is composed of two parts, the first of which resides locally on the user's Windows-based PC. It allows the user to download field data collected with the SL-RAT, including the GPS coordinates where measurements have been made. The cloud component allows for management of users, validation of test results, workforce productivity measurement, and generation of data

files that are compatible with a variety of GIS and work-order management systems. **877/747-3245; www.infosenseinc.com.** 

#### 26. Sensoray Model 2253P Codec

The **Model 2253P Codec** from **Sensoray** can collect and archive all video capture and corresponding data in tandem with other GIS mapping systems. It combines audio/video codec with a GPS receiver and multifunction port functionality. It can simultaneously encode, decode and preview A/V content and is housed in a rugged, compact exterior. All operating power is supplied by a single USB port. Each of the two multifunction ports included can operate as an incremental quadrature encoder interface or as dual general-purpose digital inputs (GPIO). Encoder counts, GPS data and GPIO states can be monitored and real-time encoder counts and GPS data can be overlaid onto any video stream. **503/684-8005; www.sensoray.com**.

#### SOFTWARE

#### 27. Pipeline Analytics WinCan VX

**WinCan VX** from **Pipeline Analytics** emphasizes a productivity-oriented, fully customizable user interface with cloud-based data access and substantially enhanced reporting and analytical capabilities. It offers new support for value-added processes like pipe cleaning, rehabilitation and leak detection. It can help augment existing functional areas like GIS, laser/sonar scanning, side scanning, image measurement and municipal database integration. To accommodate large municipalities, it has been performance benchmarked on databases exceeding 5 million records. **877/626-8386; www.pipelineanalytics.com.** 

#### 28. Pipelogix GIS Module

With the addition of the **Pipelogix GIS Module** added to ArcMap, supervisors can view all surveys performed on an asset. The toolbar filters survey data in the master database to highlight pipes with selected conditions, grades or score values, allowing the user to link to the video or survey. Survey conditions can be exported to a shape file or a geodatabase feature class. When opened in ArcMap, this layer displays the condition along the length of pipe. Selecting the condition will link to the video and jump to the correct footage for viewing. Seeing the problem and where it exists on the pipe



can make it easier to schedule repair and cleaning crews. It is compatible with ArcGIS 9.3 through 10.3. 866/299-3150; www.pipelogix.com.

#### 29. t4 Spatial

The cloud-based **t4 Spatial** platform makes hard-to-access information instantly available on any device, through an intuitive geospatial interface. Integrated data from PACP inspection videos, GIS, sensors, systems and services becomes a powerful tool for maintenance and management. The platform's advanced analytics enable work plans across all assets and improve regulatory compliance. Mitigate risks by knowing when, where, how and why to clean, inspect and remediate. The platform reduces maintenance costs, improves operations and fosters interdepartmental collaboration, all with no capital expenses. **805/921-3000; www.t4spatial.com. ◆** 









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Envirosight named Steve Webster channel development manager. He will split his time between product and service management for the company's regional sales partners. With over 32 years of industry experience, he'll be tasked with conducting product launches and product demos.

**MARCH 2016** 

#### Smith Flow Control names president

Smith Flow Control USA appointed Tracey Goldsmith president. Goldsmith, who joined the company in 2012, is responsible for strategic development and global operations.



Tracey Goldsmith

## GPS Insight recognized for rapid growth

GPS Insight ranks No. 431 on Deloitte's Technology Fast 500, a ranking of the 500 fastest-growing technology, media, telecommunications, life sciences and energy tech companies in North America. The company was also ranked the 40th largest and 21st fastest-growing company in Arizona at the *Phoenix Business Journal's* Arizona Corporate Excellence (ACE) Awards.

#### Nu Flow appoints vice presidents

Nu Flow named Justin Mizell executive vice president. He will be responsible for overseeing sales throughout Nu Flow's East Coast locations. Joshua Shrock was named vice president of East Coast operations.

#### Raven Lining Systems recognized

Raven Lining Systems and WT Energy Services, a certified applicator, were recognized as one of *Water & Wastes Digest's* Top Projects of 2015 for the work done to rehabilitate potable water storage tanks for the Town of Wilson, Oklahoma.

#### TRIC Tools CEO makes appearance on SiriusXM

John Rafferty, CEO and marketing director at TRIC Tools, appeared on SiriusXM Satellite Radio's weekly program Bay Area Ventures on Nov. 23. Rafferty discussed the company's history and product innovation with host Donald Landwirth.

#### LMK's Hydro Hat withstands multiple patent reviews

The recent ruling of the Patent Trial and Appeal Board of the United States Patent and Trademark Office will have no impact on the continued validity of the fundamental patent claims surrounding LMK's surrounding commercial embodiments for the Insignia Seal, the company said. Specifically, claims covering the Hydro Hat remain intact and valid following challenges to LMK's patent claims made by BLD Services.

## Envirosight expands offering of sewer inspection vehicles

Envirosight will expand its offering of Preferred Build-Out (PBOs) in 2016. The expanded offering includes the addition of a Ford Transit chassis option with a gas generator. Feature enhancements include expanding the capacity of washdown tanks from 10 gallons to 18 gallons in most packages; installation of all generators with a dedicated battery; a full corkboard wall above the operator's desk; and custom shelving with tool holders above the equipment bay workbench.

Laser scanner helps municipality assess water supply tunnel



#### **Problem:**

The City of Bellingham, Washington, wanted to inspect one of its water supply tunnels in order to proactively address any potential threats to service, including corrosion, cracks, instability and stress. Inspections typically require the tunnels to be removed from service. Water supply tunnels, however, are critical infrastructure and it's preferable to avoid removal from service unless necessary.

#### Solution:

Unlike traditional inspection methods, 2G Robotics underwater laser scanners enable water supply tunnels to remain in service during inspections, allowing assessments to be conducted efficiently and effectively at no inconvenience to operations or customers. The systems capture high-precision 3-D models and measurements of underwater structures and environments. These models provide the accuracy needed for detecting and assessing damage, developing design and repair plans, performing maintenance and installations, and ensuring continued safe operation.

#### **RESULT:**

The ULS-200 generated a high-resolution 3-D model of the water supply tunnel, providing detailed dimensional information of small features and overall tunnel deformations. Using the data, engineers were able to make informed, cost-effective decisions about the expected longevity of the tunnel, maintenance requirements, and how to best proceed with repairs, without ever disrupting the water supply. 519/489-0005; www.2grobotics.com. **♦** 





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## PRODUCT NEWS

#### MARCH 2016

Product Spotlight

## Plug Hug attachment easily cleans and clears hydrants

By Luke LeNoble

The Plug Hug equipment attachment automates the process of fire hydrant cleaning. Used with a skid-steer, backhoe, mini-loader or excavator, it makes a hydrant paint-ready and can clear snow-covered or plowed-under hydrants in about two minutes, saving municipalities time and money compared to manual cleaning, sandblasting or shoveling.

"The Plug Hug was designed and developed to provide municipalities with a new tool to clean and prepare fire hydrants for painting," says Doug Marshall, chief operations officer. "It takes the rust off all the bolts, removes the paint, debris and weeds that may be around the hydrant."

The steel attachment, which works on all styles of hydrants, is powered by a standard auger-drive motor (required) and is connected by a 2-inch universal hex or round receiver. Inside The Plug Hug, six plates with 60 steel cables contain over 17,000 needle-like end points that provide the descaling as the attachment is rotated over the hydrant.

"Because it's an attachment that sits off the front of a skid-steer, backhoe or a front loader, there's no more physical contact to the hydrant," Marshall says. "So it eliminates the hand and eye injuries that go with the hand-held instruments because the operator is in the cab of the equipment."

And it's environmentally friendly.



"It literally turns the paint to powder and maybe some chips down at the base of the hydrant," Marshall says. "It's such a small requisite amount there's no EPA requirements for cleanup. It's very expensive for an abrasive blasting contract because of all the regulatory requirements."

A snow-removal conversion kit is also available. Conversion takes about 15 minutes, enabling the unit to clear a 4-foot-diameter access area around the hydrant in about 60 seconds.

"For those of us who live above the snow line, hydrants get snowed under or plowed under by street plows in the winter and become inaccessible for Public Works folks to maintain them if there's an issue or for firefighter access if there's an emergency," he says.

The attachment can also be used to move snow for creating a pathway to the hydrant, eliminating the need for manually shoveling out the hydrants and potential injury.

"We looked at eliminating team member injuries from a hand, eye and back perspective, and the public safety issue of hydrants buried in snow, while reducing costs and increasing productivity," he says. **719/313-2791;** www.theplughug.com.

#### Flomatic silent wafer check valves



Model 888 silent wafer check valves from Flomatic Corp. feature EPSM elastomers and are NSF/ANSI Standard 61 certified for drinking water systems. **800/833-2040; www.flomatic.com.** 

#### Water Cannon poly drive pressure washers



Poly drive pressure washers from Water Cannon are made for commercial and industrial cleaning applications. Features include a laser-aligned Gates poly drive belt system, flat-free oversized tires, powder-coated steel frame, onboard 15-gallon fuel tank, GX Honda twin-cylinder gasoline engine, and removable roll cage with hose reel platform and 250-foot-capacity reel. Accessories include tank-feed plumbing on 8 gpm model, gun/wand assembly with quick connects, 50-foot highpressure hose with quick connects and four color-coded QC spray nozzles. **800/333-9274; www.watercannon.com**.

#### Larson Electronics LEDLB-4C colored LED light emitter



The LEDLB-4C colored LED light emitter from Larson Electronics produces a 90-foot-long by 70-foot-wide light beam with 720 lumens. Four 3-watt colored LEDs produce 180 lumens each and are arranged in rows. The LED light bars are IP68 rated and waterproof. It can run on 9 to 42 volts and provides 12 watts of optional color output in red, blue, amber, green or white. **800/369-6671; www.magnalight.com.** 

#### Ditch Witch RT80 ride-on trencher



The midrange RT80 ride-on trencher from Ditch Witch is powered by a 74.5 hp turbocharged Deutz Tier 4 diesel engine. A compact design and axle capacity give the trencher a static load rating of 39,000 pounds. Features include a tight turn radius, three-speed shifton-the-fly ground drive controls for improved versatility, along with a standard cruise control system that senses changing load conditions and automatically adjusts. An LCD color display shows engine information and diagnostics. **800/654-6481; www.ditchwitch.com.** 



#### Rock Mills Enterprises manhole cover, drainage grate remover

The remote-control Lifter PLUS manhole cover and drainage grate remover from Rock Mills Enterprises delivers 3,500 pounds of magnetic gripping capacity. Options include a roadway camera and dash monitor in addition to a 30-inch swing arm with 600 pounds of load capacity. **712/451-6550; www.rockmillsent.com.** 

#### Sherwin-Williams water-based resurfacer



The Dura-Plate 2300 epoxy-modified cementitious resurfacer from Sherwin-Williams is designed for patching and filling voids and bugholes in concrete and masonry structures, minimizing the potential for pinholing and outgassing. The abrasion-resistant coating is part of a three-component kit that contains Portland cement, hydrophobic thixotropes, fiber reinforcement, graded silica sand and other aggregates. It contains the Part A epoxy, Part B hardener and Part C mortar. **800/524-5979; www.sherwin.com/protective.** 

#### CAS DataLoggers water level logger

The MX2001 Bluetooth Low Energyenabled Water Level Datalogger from CAS DataLoggers and Onset is designed for wireless communication with mobile devices. The HOBO MX water level logger is designed for monitoring changing water levels in a range of applications, including streams, lakes, wetlands, tidal areas and groundwater. Using Onset's free HOBO-

mobile application — available on iOS devices — users can configure the logger and view/share data from its deployed location from their smart-phone or tablet. **800/956-4437; www.dataloggerinc.com.** 

#### IVC radiometric thermal video camera

The FV-3543-1 radiometric thermal video camera from Industrial Video & Control is capable of sensing temperatures for a range of applications, including process monitoring, product testing, quality control, equipment monitoring and worker safety. It detects temperatures within up to eight user-defined zones. High, low,

average and standard deviation thresholds can be set for each zone. A camera alarm communicates to a plant's control system via OPC or Modbus/TCP and integrates with DCS and SCADA systems. **781**/**255**-**7400; www.ivcco.com.** 

#### Trimble pipe lasers

Spectra Precision DG613 and DG813 pipe lasers from Trimble are designed for use in manholes with precast inverts and a tight radius. Both models have a grade range from negative 12 to 40 percent and are fully self-



leveling over the entire grade range. The cross axis ensures the laser will be level. The RC803 remote control provides full function control and utilizes infrared communications when in the pipe at a distance of up to 500

feet. Flexible power options provide up to 40 hours of operation with NiMH rechargeable batteries and 50 hours with alkaline batteries; alkaline batteries can be used directly in the laser without a separate battery pack. **800/527-3771; www.spectralasers.com.** 

#### COXREELS motorized hose reel



The 1125 Series of motorized hose reels from COXREELS features a one-piece, allwelded A-frame base as well as a low-profile outlet riser and an open drum slot design that provides for a non-crimping, smooth hose wrap. The reel is operated by a direct gear drive that requires no maintenance, lubrication or chain adjustment. In place of the chain sprockets, the

direct gear drive ensures an uninterrupted reel operation. 800/269-7335; www.coxreels.com.

#### Snap-on drive extensions

Williams Flextensions drive extensions from Snap-on Industrial Brands are designed for hand and power tool use by technicians who work with engine and heavy-equipment manufacturing, assembly and repair. Features include a black oxide finish, TIG-welded socket retention pin that provides full rotation power to the socket, a 7/32inch cross hole, and bevel drive end. The extensions are available in a variety of SAE and metric socket sizes and extension lengths, in both 1/2-inch and 3/8-inch square drives. **800/446**-

7404; www.snaponindustrialbrands.com.

#### RauschUSA portable mainline inspection system

The Mobile Pro portable mainline inspection system from RauschUSA features a lightweight motorized cable reel (Cubix 300 with 1,000 feet of cable) and a built-in 12-inch monitor and control unit that can fit in the bed of a truck. The C135 camera/tractor system with 17-square-inch footprint includes modular upgrades for laser profil-

ing and lateral launching from the same unit. 877/728-7241; www.rauschusa.com. ↓

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Looking for a job in the water-wastewater industry? WATER DISTRICT JOBS, an online career resource, lists dozens of great career opportunities on its website. Job listings are updated daily. You can also post your resume so employers can find you. Visit www.Water DistrictJobs.com for more information. (M04)

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

#### **TV INSPECTION**

USED Envirosight ROVVER System: Brand new RC90 camera. Cable reel (SN 360570) has new power supply, motor, clutch, cable (656') and winding rollers. 125 crawler (SN 0260768) has new top plate, side plates, axles and seals, plus new control board compatible with rear-view camera accessory (not included). CCU (SN 0160981) with new power card, new 56V card, new +/-26 card, and new card. Control pendant (SN 0492645) is compatible with RC90 camera and R225 crawler. \$27,500. Call 973-252-6700. (MBM)

## WORTH NOTING

#### **PEOPLE/AWARDS**

**Charlotte (North Carolina) Storm Water Services** has been recognized nationally for its stormwater management efforts, green infrastructure initiatives and for curbing pollution of streams and lakes. The city got the highest overall score in the awards program, which is sponsored by the Water Environment Federation and the Environmental Protection Agency. The awards honor high-performing municipal stormwater programs. Charlotte earned the highest combined scores in both the innovation and program management categories.

**Chris French** has joined the Water Environment Federation as its new director of stormwater programs. French, who has more than 15 years of water sector experience, will guide the efforts of the WEF Stormwater Institute, a recently launched center of excellence that provides national leadership for sustainable stormwater management.

The National Recreation and Park Association, headquartered in Ashburn, Virginia, has been awarded a two-year, \$2.5 million grant from The JPB Foundation for the Great Urban Parks Campaign to explore the social and environmental benefits of green infrastructure projects in parks, especially in underserved communities. The grant funding will support on-the-ground projects in local communities and will also help NRPA develop resources and training programs on green infrastructure for park, recreation, planning and other professionals.

The Indiana Office of Community and Rural Affairs announced that more than \$9 million in funding for the Stormwater Improvements Program was awarded to 11 communities throughout the state. The SIP is funded through the federal Community Development Block Grant with the goals to cut stormwater treatment and energy costs; generate jobs and spur economic development; protect rivers, lakes and vital landscape; and reduce flooding. Projects receiving SIP funding include:

City of Bicknell, \$870,500 Town of Edinburgh, \$858,700 Town of Franklin, \$1 million Town of Fowler, \$1 million Town of Ligonier, \$365,810 Town of Middletown, \$983,000 Town of Morgantown, \$949,000 City of Rushville, \$382,500 Town of Stinesville, \$898,750 City of Sullivan, \$1 million Town of West Terre Haute, \$1 million



#### **PROWLER EASEMENT MACHINES**

The Prowler Easement Machine is available in extendable track, track, wheeled or track over wheel configurations. Reel available in capacities To 1,000 feet. Many options available. For more information contact:

3T Equipment Company Inc. 800-969-3001 tttequip@yahoo.com, Web Site at www.3TEquipco.com

#### LEARNING OPPORTUNITIES

#### American Society of Agricultural and Biological Engineers

The ASABE is offering a Young Professionals Development workshop on April 8-9 in Lexington, Kentucky. Visit www.asabe.org.

**American Society of Civil Engineers** 

The ASCE is offering: March 2 – Cold-Weather Stormwater BMPs That Work, online March 10 – Pumping Systems Design for Civil Engineers, St. Louis Visit www.asce.org.

#### Wisconsin

The University of Wisconsin Department of Engineering-Professional Development is offering Using WinSLAMM v. 10.2: Meeting Urban Stormwater Management Goals R324 on May 5-6 in Madison. Visit http:// epdweb.engr.wisc.edu. ◆

#### CALENDAR

#### March 10-12

National Utility Contractors Association Convention, El Conquistador Resort, Fajardo, Puerto Rico, Visit www.nuca.com.

#### April 25-27

American Water Resources Association Spring Conference, Sheraton Anchorage, Alaska. Visit www.awra.org.

#### May 22-25

American Public Works Association North American Snow Conference, Connecticut Convention Center, Hartford, Connecticut, Visit www.apwa.net.

#### May 23-26

National Utility Contractors Association Annual Washington Summit, Embassy Suites Washington D.C. Convention Center, Washington, D.C. Visit www.nuca.com.

#### June 19-22

American Water Works Association Annual Conference and Exposition, McCormick Place, Chicago. Visit www.awwa.org.

#### July 11-13

American Water Resources Association Summer Specialty Conference: GIS and Water Resources, Hilton Sacramento Arden West, Sacramento, California. Visit www.awra.org.

#### July 17-20

American Society of Agricultural and Biological Engineers 2016 Annual International Meeting, Orlando, Florida Visit www.asabe.org.

#### Aug. 22-25

StormCon, Indiana Convention Center, Indianapolis. Visit www.stormcon.com.

#### Aug. 28-31

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

#### Sept. 12-14

National Rural Water Association WaterPro Conference, Orlando, Florida. Visit www.nrwa.org.

#### Sept. 28-Oct. I

American Society of Civil Engineers 2016 Convention, Oregon Convention Center, Portland, Oregon. Call 800/548-2723 or visit www.asce.org.

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

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