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November 2015

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TECH TALK: GROUT IS GAINING GROUND  
IN THE FIGHT AGAINST I&I

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# MAKING INROADS ON I&I

Naperville, Illinois, turns to grouting  
as a complementary weapon  
to CIPP lining in the fight  
to tighten up its system

PAGE 20



Tony Conn, supervisor for the  
Naperville Department of Public Utilities,  
Naperville, Illinois

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<p><b>NAUGHTY</b>          have big teeth          and camping.          dogs and cats          baboons or          ed monkeys.          ne. #1171</p>	<p><b>NEGLECTED SEWER</b>          seeks hard working professional          for long-term relationship. Must be          well built, reliable and willing to          put up with my frustrating debris,          unmanageable roots and massive          greasy buildups. #3109</p>	<p><b>LONELY ROO</b>          seeking tall          flat assistant          removal. Just          likes biking and          get"</p>
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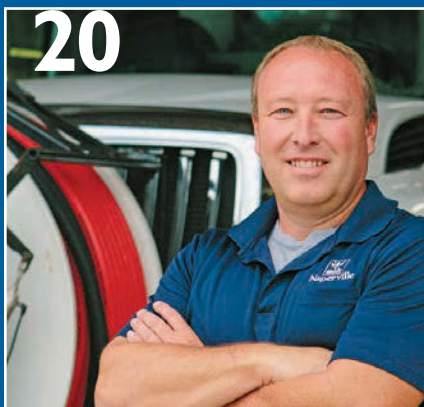
# INSIDE:

LOCATION & LEAK DETECTION



## ON THE COVER:

Naperville (Illinois) Department of Public Utilities supervisor Tony Conn and his team have revamped their approach to I&I in the city's collections system. Their success has led to the cancellation of two scheduled rate increases. (Photography by Alyssa Schukar)



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Published monthly by:



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



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

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



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**CIRCULATION:** 2014 average circulation was 38,192 copies per month (U.S. and international distribution).

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# TWO STORIES AND A WEBINAR

We're giving you three ways to learn about keeping I&I out of your collections system



FROM THE EDITOR

Luke Laggis

Al Rose said it's hard to hold a candle in the cold November rain. Well, it's hard to watch that rain inundate your collections system and overwhelm your treatment plant, too. He probably would have mentioned that in the song, but it's not quite as lyrical as the whole candle thing.

Inflow and infiltration is insidious. It brings sand and sediment into pipes, prematurely wears lift station pumps and can overwhelm treatment facilities, which can lead to a whole host of other problems. According to the U.S. EPA, 50 percent of all flows to wastewater treatment plants come from I&I. The costs incurred are substantial, and the resulting problems can be catastrophic. Enjoy dealing with SSOs? Anyone?

The profile on Naperville, Illinois, in this issue tells the story of how that utility has attacked its own I&I problem and significantly reduced flows to its wastewater treatment plant. There was no one magic bullet,

as the story points out, but there were a couple indispensable methods, the combination and coordination of which became a powerful weapon.

Those methods? Cured-in-place pipe and grout. CIPP has been a widely accepted approach to solving all sorts of pipe maladies for some time now, but grouting hasn't yet earned an equal reputation. When addressing I&I specifically, however, CIPP has its limitations. What Naperville has discovered, with great results, is that grouting can pay perfect complement to CIPP and effectively make up for those limitations.

Grouting is also the subject of this month's Tech Talk feature. We talked to experts from Avanti International, Prime Resins and Sealing Systems Inc., and built on the example from the Naperville story to show you how and why grouting should be among your approaches to I&I reduction.

There are many factors to consider when choosing grout types and application methods. They all have their strengths and weaknesses, but if you understand the basics, you'll have a much easier time selecting materials and methods that will serve your system well. Understanding how grout and CIPP can be used together will really boost the potential for positive results.

And if that's not enough information on grouting and I&I reduction, we have another opportunity for you. On Nov. 18, in conjunction with Avanti International, National Power Rodding (Carlyon Corp) and the Naperville Department of Public Utilities, MSW will be hosting a webinar on the subject.

Learn directly from Naperville supervisor Tony Conn and John Maniak of National Power Rodding through the lessons they've learned in their own work. The webinar will cover how to establish and execute a plan of action to resolve infiltration.

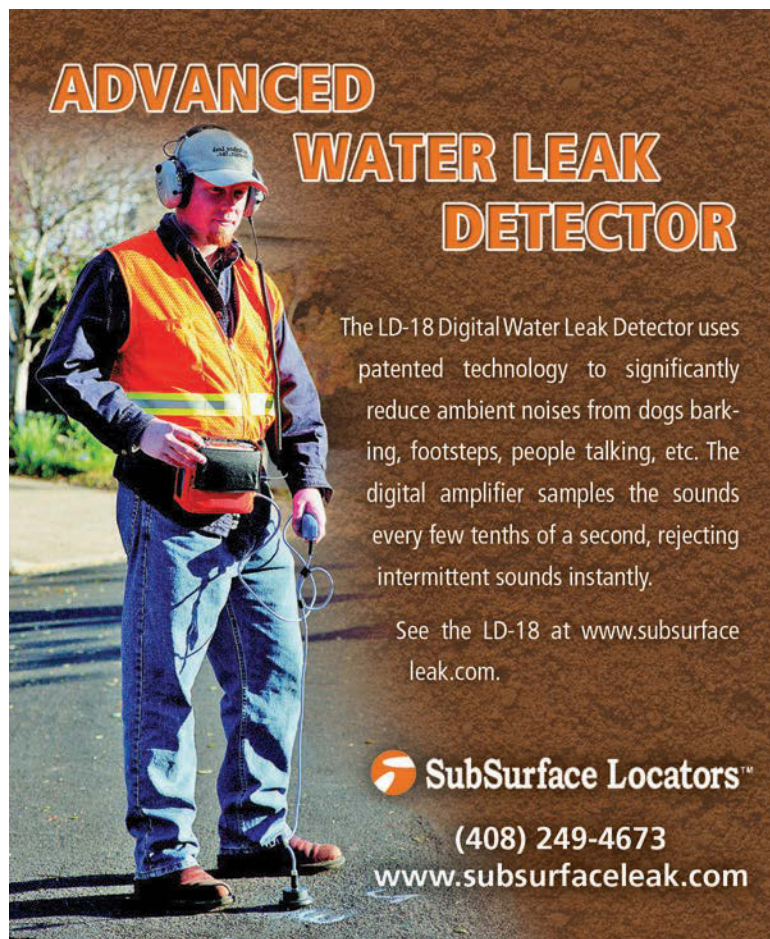
I'm excited to serve as moderator, and I hope you'll take advantage of this opportunity.

Participation in the 60-minute, live online learning event is complimentary and earns 1 PDH credit.

To register for the event, visit <http://bit.ly/1jmNZDf>

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](mailto:editor@mswmag.com).





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## STRANGE BREW

### Battle of the Beers at WEFTEC 2015

The beer was flowing at WEFTEC 2015, but perhaps more important, the standing-room-only crowd was engaged in exciting conversation on the feasibility of sustainable water use. Find out how a duel between Oregon and Wisconsin for top “effluent lager” came down to the last drop in the first-ever Sewage Brewage Smack Down. [mswmag.com/featured](http://mswmag.com/featured)

## OVERHEARD ONLINE

“It was an amazing 11 days it took them to drain the water out of the city; these are truly the biggest unsung heroes in New Orleans.”

— *Pump Station Employees Braved Dire Conditions*  
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Inspecting miles of flood control waterways, reservoirs and other infrastructure is getting a lot easier thanks to new technology. The use of remotely operated vehicles — or ROVs — is increasing as prices come down and operation is simplified with smartphones, tablets and laptop computers. Learn how you can accomplish in a just few minutes what used to take hours, and do it much safer.

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# BREAKING THE DIGITAL BARRIER

Brunswick moves ahead of the pack in its approach to system maintenance, improvements and public outreach

*By Jim Force*

**Brunswick Sewer District collections operators Aaron Temple (left) and James Sonia set traffic cones around their Vac-Con combination truck in the early morning light before cleaning a sewer main. (Photography by Josh Kuckens)**





**B**runswick, Maine, has been around a long time. The town was incorporated in 1739. The Brunswick Sewer District dates to 1947. But that doesn't mean the utility is behind the times. In fact, in many aspects of collections and treatment, it's a leader.

It had the foresight to separate its 65 miles of sewer pipe in 1955, before the term "CSO" was commonplace. It has gone completely digital, with its collections crew using tablets and pump stations reporting data wirelessly to the control center. And it keeps its ratepayers fully informed of plans and budgets through a variety of media, including a Web portal and a "first-in-the-nation" interactive kiosk that explains the treatment and collections system using QR codes people can access through their smartphones.

"We're using technology to make our jobs quicker and easier, as well as get the word out to the public," explains Leonard Blanchette, the district's general manager. "In the old days it might have been 'out of sight, out of mind,' but we don't want that now."

Blanchette says the open-door policy has helped customers understand and accept rate increases necessary to fund the capital improvements being made both to the utility's sewers and its wastewater treatment plant.

### The system

Brunswick is located in southeastern Maine, on U.S. Route 1 near the Atlantic coast. The Brunswick Sewer District collects wastewater from portions of the Town of Brunswick and the neighboring Town of Topsham via a 60-mile network of gravity sewers and 5 miles of force main. In the older section of the urban area, pipe is 6- to 8-inch clay and can be more than 100 years old. In areas developed more recently, sewers are constructed of asbestos-lined concrete and PVC. Interceptors are up to 30 inches in diameter. (Storm sewers are the responsibility of the Public Works Department.)

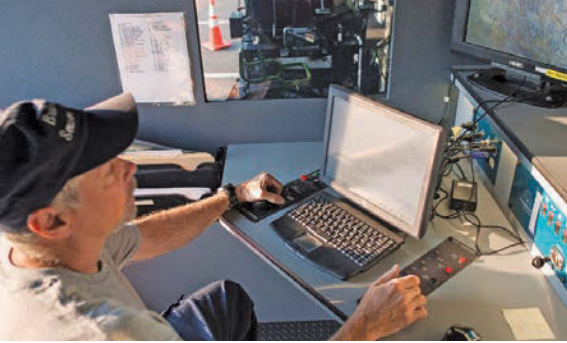
A series of 19 pump stations moves the wastewater to a 3.85 mgd (design) treatment plant consisting of primary tanks, trickling filters and seasonal disinfection. Treated water discharges to the Androscoggin River, which flows into the Gulf of Maine. A portion of the dewatered Class B biosolids are composted and reused through an arrangement with an outside contractor, and the rest is land-applied.

The district has agreements with several of its neighbors to provide collections and treatment services. In addition to accepting wastewater from the Town of Topsham and servicing that community's seven pump stations, Brunswick has an operations and maintenance agreement to



**Brunswick Sewer District General Manager Leonard Blanchette on the site of the utility's new facility, which is currently under construction.**

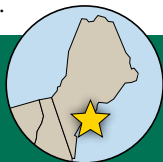




**Top Left:** Brunswick Sewer District collections operator Ernie Bergeron evaluates inspection video inside the CCTV truck, outfitted with equipment from Cobra Technologies. **Right:** Senior operator Mike Jouver reviews a map of system assets on his tablet with Esri software. **Bottom Left:** James Sonia (left) and Aaron Temple use a Vac-Con combo unit to clean a sewer main.

manage a community-sized subsurface wastewater system in the Town of Brunswick, serving 28 homes and featuring nine community-owned leachfields. The district also accepts and treats wastewater from the former Brunswick Naval Air Station, now a redevelopment site. The military facility was closed during the federal base realignment program several years ago.

## PROFILE: Brunswick (Maine) Sewer District



**FOUNDED:**  
1947

**POPULATION SERVED:**  
16,000

**AREA SERVED:**  
Portions of the Town of Brunswick,  
Town of Topsham

**STAFFING:**  
17 total (6 assigned to collections and  
pumping)

**INFRASTRUCTURE:**  
60 miles of gravity sewers, 5 miles of  
force main, 19 pumping stations, 1,200  
manholes, 3.85 mgd treatment plant

**ANNUAL EXPENSE BUDGET:**  
\$2.5 million for all departments,  
\$770,000 for collections and pumping

**WEBSITE:**  
[www.brunswicksewer.org](http://www.brunswicksewer.org)

**FACEBOOK:**  
[www.facebook.com/brunswicksewer](http://www.facebook.com/brunswicksewer)

The widespread O&M duties fall to the district's six-person collections and pumping staff. "They keep pretty busy," Blanchette says.

### Maintaining the lines

Blanchette's team schedules about 20 percent of the 65-mile sewer system for inspection and cleaning each year. The district purchased a new Ford box truck this year and mounted its existing Cobra Tech televising equipment on it. To clean the system, the crew has its own Vac-Con jet/vac truck.

It's a pretty standard operation, but what distinguishes the Brunswick team is its use of new digital technology.

"Everything now is digital," Blanchette says. "We have implemented the ArcView GIS system. Last year we contracted with Esri to store all our information on their cloud. That includes all our videos and our system attributes."

Operators are equipped with tablets so they can pull information off the cloud while they're in the field, obtain their assignments and record their activities.

Blanchette credits Assistant General Manager Robert Pontau Jr., P.E., with developing and implementing the system.

"Like a lot of sewer districts, we have older members on our staff," Blanchette says. "But Rob has convinced them it's not hard to learn. We buy the equipment and teach our staff how to use it. When you have confidence in your people and give them time to learn it and get comfortable with it, it's amazing what they can do."

The technology upgrade extends to the district's pump stations, as well. Blanchette explains that in years past, his team might have had to rely

on neighbors or emergency responders to call the district and report high or low water alarms. Phone numbers and station names were placed on each pump station for easy identification.

Now, however, using a Mission Communications system, pump station conditions are communicated wirelessly to staff via cellphones. "Each pump station has its own SCADA system," Blanchette says. That lets his team monitor the system remotely and continuously.

And it doesn't stop there. "We're still working on it. We have the entire system mapped, manhole to manhole, but we are still collecting all the system attributes to plug into the GIS," Blanchette says. "We're setting it up so the public has access to the information through our public portal — lengths and depths, materials of construction, inlets and outlets."

"We're not going to hide our manholes, our pumping stations, our treatment plant. We'll put the system information out there."

### The future

Blanchette, who started working in the clean-water field during summers when he was studying for a business administration degree at the University of Maine, joined the Brunswick staff in 1987 and has plans to retire after the next five years. But those years will be plenty busy.

The old clay lines will see much of the action. "Even though we've separated our system, we see a lot of I&I when it rains," Blanchette says. "We have a gravel aquifer here that in some locations is just 3 to 4 feet beneath the surface. Our sewer lines are down 8 feet. The old clay lines have no gaskets."

He says the treatment plant has a hydraulic capacity of 11 mgd but since substantial pipe

*(continued)*



prevent SSOs

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## THE WATER TREATMENT CYCLE 'LIVE'

In what may be a "first" in the clean-water profession, the staff of the Brunswick Sewer District has created an interactive poster and video of the water treatment cycle, using QR codes so data can be accessed via smartphones.

The 13-minute video was filmed, edited and narrated by staff, explains district General Manager Leonard Blanchette.

It begins with the typical household internal plumbing system, animated to show potable water going in and wastewater going out. The viewer is then guided on the journey wastewater takes through the public sewer system on its way to, and through, the treatment plant. Actual video clips show various parts of the district's collections system, including pipes, manholes and pump stations. Once the flow reaches the treatment plant, the viewer sees the sequential processes the water goes through as it is treated at the district's 3.85 mgd basic primary treatment and trickling filter secondary treatment processes.

"Even more amazing is the interactive poster our staff created," says Blanchette. "The poster features a QR code at each station of the video that allows anyone with a smartphone to scan the corresponding code to view a short one- to two-minute video of the featured portion of the water treatment cycle."

The poster is designed so that it can be provided to area schools, mounted in public buildings and anywhere else the public can access it. A kiosk, constructed by the staff at the district's Water Street Pumping Station, is located next to a highly used walking and biking path along the Androscoggin River.

The pump station's fence was repositioned to provide the space for the kiosk and two wooden benches. "It provides a quiet resting spot for the walkers, joggers and bicyclists who use the very popular walking/bike path," Blanchette says.

This project was the brainchild of the district's assistant general manager, Robert Pontau Jr., as part of the employee goals program. "Robert managed the project, giving staff the tools, equipment, software and most importantly the confidence to create the dialogue, film the episodes, edit and narrate the video," says Blanchette. "It was truly a group project, and the creativity of the staff soon became very apparent."



The Brunswick Sewer District staff includes (from left) Lorraine Caron, Darcy Dutton, Bonnie Shipman, Aaron Temple, Mike Jouver, Jason Prout, Lisa True, Wesley Wharff, Ernie Bergeron, James Sonia, Robert Pontau Jr., Gerald Bibber, Daniel Munsey, Leonard Blanchette, Thomas Mason, Matthew Densmore and Jennifer Nicholson.

replacement and pipelining work in 2005 has never climbed above 9 mgd. "Even with 10-inch rainstorms," he says.

Even so, Brunswick's current five-year, \$1.5 million, pipe replacement capital plan calls for open-cut installation. "We're going to 8-inch diameter," he explains. "That will give us more capacity and make it easier to clean. If we were lining the 6-inch clay pipe, it was hard to get the TV cameras and the lateral cutter through it unless it was gun-barrel straight."

He expects the larger pipes will be relined where necessary, as long as the host pipe is in good shape. "We have a rolling five-year plan which stretches out 20 years," Blanchette says. "Our program is twofold: replace old pipe and make sure all pipes are watertight."

"We're not going to postpone it. It has to be done."

Another capital improvement program involves a pumping station. "We're tearing it out completely and building a new one right next to it," Blanchette explains. "It was an old Smith & Loveless type with a wet well only 4 feet in diameter. The new one will have an 8-foot-diameter well and be powered by Flygt submersible pumps."

Lastly, Brunswick is upgrading its wastewater treatment plant, which dates to the 1960s. The district is embarking on a \$22 million upgrade,

modernizing equipment and adding SCADA and other technology. The upgrade will include two 5,000-square-foot buildings to house vehicles and equipment as well as give the collections and pumping division its own facility on site.

The capital improvements are being funded by the state revolving fund coupled with a series of rate increases to pay off the loan.

"Fortunately for us, our current rate is \$5.36 per 100 cubic feet and is in the midrange for southern Maine," Blanchette says. "We have room to move over time."

### Public acceptance

Public acceptance of the rate increases and ratepayer understanding of the need to improve drive Brunswick to focus seriously on public information. Blanchette says his team talks at town meetings, presents regularly at the town council, sends out newsletters and uses the Internet and Facebook to keep the public informed. The interactive kiosk, accessible by cellphone codes, has been a popular informational feature (see sidebar).

"That's our biggest challenge," Blanchette says. "Getting the public to understand and buy in to the improvements we need to make and the pipe replacements ... who we are and where we are going, and why we need their support." ♦

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# ASK, DON'T TELL

Good questions are the only answer for managers who want more engaged, confident and productive employees

By *Ken Wysocky*

**H**ere's a thought-provoking question that managers should ponder: Do you typically ask good questions?

Odds are that you may not even know how to answer that question, but that doesn't mean you're dumb. If you're like most people, you probably haven't even given the subject much thought.

But here's the unvarnished truth: Asking good questions is one of the simplest yet most effective ways to build employees' confidence and increase their sense of engagement at work. Moreover, asking the right questions often generates great ideas that could improve processes and lead to better productivity and efficiency, increased profitability and improved customer satisfaction, says Gary Cohen, the author of *Just Ask Leadership: Why Great Managers Always Ask the Right Questions*.

"My research shows that very few people are consciously competent about asking the right questions," notes Cohen, the founder of CO2 Partners ([www.co2partners.com](http://www.co2partners.com)), a consulting firm that specializes in coaching executives and creating more engaged and high-performance workplaces. "And it's a very underrated skill because most people think it's just too obvious for consideration.

"But in today's workplace, the level and speed of change is so rapid and the complexity of our systems is so great ... that the only way for leaders to handle it all is by asking good questions," he adds.

Some additional food for thought: True leadership is all about allowing others to flourish, not just the managers. "It really takes humility to say, 'It's not about me, it's about someone else,'" Cohen says. "That's a very successful form of leadership.

"You have to change your mindset from thinking you always know the answers to conceding that you don't know the answers," he continues. "Or that you think you might know the answers, but there's also a possibility that someone else knows more. You don't ask questions to play a game with someone to get the answers you want to hear. You legitimately ask the question so the employee can self-discover the answer."

That's a difficult philosophy for many managers to embrace because they take great pride in always having the right answers to solve problems. Moreover, many businesses and organizations create corporate cultures in which leaders are lionized and revered for this ability and,

as such, they're expected to have all the right answers. "We like our heroes — our icons," Cohen notes. "They seem infallible because they tell instead of ask. But it's an odd dichotomy because while we like to watch leaders like that, we don't want to work like that. We're all waiting to be asked, not told."

## Ask, don't tell

When managers ask their employees for help in solving problems instead of just telling them what to do, the results can be game changing. The first benefit is that employees feel more empowered and trusted, plus they're more accountable for the final results. Moreover, they'll also feel more open-minded about change, Cohen points out.

"If you tell someone what to do, there's usually resistance," he explains. "But if you ask someone how we should go about doing something, they're going to take their own path — and people who do that are way better employees. We need to give employees more autonomy by asking them the right questions."

Furthermore, employees usually have good insights on where a company should be going and how that could be accomplished — if only someone would just ask them.

"When I survey audiences (at speaking engagements), 97 percent of employees say they prefer to be asked rather than told, but about 75 percent of them say they've never been asked," Cohen says. "So my question is, given those statistics, why are managers telling people what to do 75 percent of the time? I once did a national survey and found that 37 percent of people say their boss seldom or never asks what their thoughts are about various things. That's unreal to me."

There's another bonus to asking, not telling: Employees tend to like their managers more when they do the former, not the latter, which in turn ratchets up engagement and productivity. Plus, if those employees get promoted, they're more likely to manage employees with an ask-don't-tell mentality, which has a very beneficial trickle-down effect, Cohen points out.

## What's the right question?

So you're ready to change your ways — but where to start? First, it's important to ask open-ended questions that provoke more than

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



just yes or no answers. “If you ask only one-directional type questions, you’re only going to get that kind of feedback in return,” Cohen says.

It’s also important to avoid leading questions that appear to steer the person to a specific answer, which defeats the whole purpose of tapping that person’s creativity and expertise in the first place. Instead, people should always ask what Cohen calls GPS questions, an acronym that stands for goal, position and strategy.

Goal questions are aimed at figuring out what a team is trying to accomplish. Position questions try to determine where things stand right now, because context is critical. These questions can center, for instance, on who needs to be involved, what resources are available, what’s been tried before and what worked and didn’t work. Last but not least, strategy questions should get employees thinking about how the team will accomplish the goal. These questions should be forward-looking and action-oriented, Cohen says.

Another thing to consider: Avoid judgment and evaluative questions, which come off as criticism. A good example is asking someone why they did a particular job the way they did (as in, “Why did you use *that* nozzle to clean the pipe?”). “Those kinds of questions sound like an evaluation of you in past orientation, as opposed to future- or direction-oriented questions,” he explains.

### Personal discipline

Breaking old habits and asking questions instead of always directing people requires persistence and discipline. “But if you change your worldview from telling to asking, you instantly become a better leader,” Cohen asserts.

Of course, you have to trust the person to whom you pose the question or you won’t trust the answer. That’s very difficult for managers who generally don’t trust people, Cohen notes. In addition, the corollary to asking the right questions is that you also must listen effectively to the answers with an open mind. And what if an employee provides a clearly wrong answer to a question? “Then you have to think about questions you can ask that will help them self-identify the errors,” he says. “They need to think about it so the error becomes clear to them.”

In the end, managers need to ask themselves if they want employees who come to work every morning and unthinkingly perform tasks as assigned, or employees who are engaged, feel valued and contribute innovative ideas. “There’s a

cost to having employees who only follow what you tell them to do — the cost of low morale, poor engagement, impeding employees’ development and lack of accountability,” he points out. “It’s much better to have employees who are thinkers and can figure things out. Greatness happens when you ask.” ♦

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# MAKING INROADS ON I&I



Naperville, Illinois, turns to grouting as a complementary weapon to CIPP lining in the fight to tighten up its system

By Erik Gunn

Naperville Department of Public Utilities technician Dino Tinajero cleans up after flushing a sewer main with a Vactor combination truck. (Photography by Alyssa Schukar)

**N**aperville, Illinois, has been battling storm-water inflow and infiltration in the city's sanitary sewer collections system for years. But after a natural calamity a couple years ago, the staff of the city's Department of Public Utilities realized they needed to step up their game.

Bringing a new approach to the problem has made a huge difference in just two years, and officials expect to continue reaping the benefits.

That new approach includes some new techniques along with some tweaks to other methods they have long relied on. But if there's a breakthrough — a magic bullet — it's the realization that there is no magic bullet, and it's a willingness to go beyond relying on just one technology for I&I reduction.

The payoff for Naperville's efforts has been reduced flows to the city's sewer treatment plant so the city doesn't have to treat more volume than necessary. And utility ratepayers have felt the payoff in their pocketbooks: For two years running, the utility has actually canceled previously scheduled rate increases.

They simply weren't necessary, says Tony Conn, wastewater collections and pumping supervisor for the Naperville Department of Public Utilities. "One of the reasons why the flows are down at the treatment plant is due to our I&I program," he says. "It's knocked down maintenance costs."

## Windy City suburb

With just under 150,000 residents, Naperville is Illinois' fifth-largest city, a mostly residential suburb 28 miles west of Chicago. The wastewater stream is typical for an American suburban community, with private homes and small commercial accounts generating most of the flow.

The two largest commercial wastewater sources are a chemical research and testing facility and a snack cracker factory. Both have pretreatment equipment, so their output isn't significantly challenging, Conn says.

Most of the city's sewer lines are clay pipe. The oldest go back more than a century to the early 1900s. The I&I sources are typical: roots that penetrate and crack pipes along with rou-

tine deterioration of the pipe materials. Many of the lines making up the system are past their life expectancy and long-term repair and replacement programs are underway.

## I&I experience

Awareness of I&I problems is nothing new for Naperville. "We've been tackling I&I as long as I can remember," says Conn, who's worked for the city for 23 years.

But in the last decade Conn and his colleagues have amped up their attack. The first wake-up call came in February 2001, when heavy rains ran off frozen ground in the city causing floods that sent water pouring into the sewer system. After that, "we started getting heavily into all kinds of sewer rehabilitation."

Naperville's treatment of choice for sewer lines has been cured-in-place pipe for mainlines, circumference lining technology for laterals, and CIP or spray lining on manholes.

The city has taken an aggressive approach to lateral lining, especially since 2003. That's when

(continued)



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**Left:** Dino Tinajero operates the controls on a Vactor combination truck while cleaning a sanitary sewer line in a newer residential development. **Above:** Utility technician Steve Subat operates the truck's jetting system remotely while flushing a sewer main.

it became city policy to line the lateral as far up on private property as the property owner allows.

On lateral jobs, the city's contractors are instructed to install a clean-out 18 feet inside the private property line and install the new CIP liner up to that point, paid for by the city.

"We know that by knocking off that additional I&I we're going to save money in the long run in maintenance and treatment costs," Conn says. The property owner also typically gets a chance to hire the contractor to line the rest of the lateral up to the foundation. "Because the lining company is already there, they'll get a very good deal," he adds.

### New challenges

The lining programs that began in the early 2000s made some inroads, but over time they also showed limitations.

Another round of flooding in April 2013 swamped portions of the city, and once again I&I problems surged.

One of Naperville's first responses was to go bigger on its rehab programs. While the city was already paying a lot of attention to fixing laterals and manholes, it began taking a more comprehensive approach. When a source of I&I is pinpointed now, says Conn, the city no longer takes a piecemeal approach to the site.

"We'll do an entire basin rehab instead of the mains," he says. "We rehab the mains, we rehab the laterals and we rehab the manholes."

That helped, but it wasn't enough.

### Enter grouting

As the 2013 floodwaters were receding, crews took advantage of the chance to inspect where the I&I was worst. What they found was that a significant source of the leaks wasn't just cracks or deterioration in the pipes themselves; leaking joints between two lengths of pipe were a major culprit, too. So were leaks at manhole terminations.

In the process, Conn says, he also came face to face with the limits of lining. "After we would line a sewer main, I&I wouldn't go away," he points out. "It would just move."

The city had used grouting in the past as an I&I tool. But in recent years city officials had been hearing more and more about the potential role of grouting in I&I reduction.

There is more than one way in which leaks at pipe joints can cause problems even after lining. The most obvious is that water can get in the joints and into newly lined pipe, once again unnecessarily increasing the volume of water being treated.

But sometimes water doesn't just enter the pipe itself — it actually penetrates the space between the liner and the host pipe. So sealing off the leaky joint not only reduces the groundwater flow into the sewer — it keeps the interface between pipe and liner free of water, too.

That's where grout comes in.

Depending on the specific soil and other conditions, any of several different products can be used to seal pipe intersection seams and prevent groundwater from entering the line.

A June 2014 project showed just how big a

difference grouting can make. A 2,500-foot length of 12-inch pipe was lined, but after a heavy rain, Conn says, "every joint was leaking heavily." Once the joints were grouted, the leaking stopped. "There was no water migration between the host pipe

(continued)



### PROFILE:

Naperville, Ill., Department of Public Utilities/Wastewater Collections and Pumping

**SERVICE CONNECTIONS:**  
41,870

**SERVICE AREA:**  
39.34 square miles (City of Naperville) plus additional portions of DuPage and Will counties in northern Illinois

**EMPLOYEES (WASTEWATER COLLECTIONS AND PUMPING):**  
13

**INFRASTRUCTURE:**  
541.95 miles of sanitary sewers; 13,457 sanitary manholes; 22 wastewater pump stations; 7 backflow prevention stations

**ANNUAL OPERATING BUDGET:**  
\$2.3 million O&M budget; \$4.3 million capital improvement budget

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and the liner.”

Naperville wasn't a stranger to grout; the city had been using grouts for years to shore up cracked and leaky manhole structures. City crews originally used 3M products; more recently, they've begun using Aqua Seal grouting materials (Sealing Systems, Inc.).

### Bolstering lining

The city now grouts leaking mains and laterals before any lining. At the termination point at every manhole, the city also installs Insignia end seals (LMK Technologies) and Sikadur 31 (Sika Corporation) to stop leaking between the host pipe and liner.

“Before, when you just put a liner in, you wouldn't worry about the termination at the manhole,” says Conn. “That's one of the biggest sources of leaks between the host pipe and the liner.”

The city uses outside contractors for the mainline and lateral lining work as well as for the grouting that is now included as part of those projects. “We take care of practically everything that has to do with the collections system,” says Conn. “I don't have the manpower to do in-house grouting for lateral or mainline rehab, so we contract that all out.”

The city's bid requests generally specify the use of AV100 grout from Avanti International. “We've had the best luck with it,” he says. “We just stay with it.”



Utility technician Jamie Antich checks the Flow-Technics monitoring and control system at the Royce Road lift station in Naperville.

### Coming test

Naperville's newest grouting initiative may be something of a test of grout used alone.

A section of the collections system with some 450 laterals has been targeted for the new project. The area has had major and persistent groundwater infiltration. The affected laterals are already under the groundwater table, making them especially susceptible to I&I even without rainfall.

Grouting where those laterals connect with the mainline had little effect, Conn says. “All it

did was move the water to the joints upstream of the lateral.”

Yet inspections of those laterals showed little evidence of pipe deterioration in the clay laterals themselves. That pointed the finger of responsibility at joints in the laterals.

Naperville is starting with a group of 60 of those targeted laterals as a pilot project. “We are going to grout the laterals from the mainline connection all the way to the house foundation,” Conn explains.

## CLEANING IS AN IN-HOUSE JOB

While Naperville's Department of Public Utilities relies on outside contractors to undertake lining and grouting for its sewer mains and lateral lines, the city has an aggressive continuing preventive maintenance program – and virtually all of it is done in-house.

Over a five-year cycle, the city cleans 1.3 million feet of sewer every year, says Tony Conn, wastewater collections and pumping supervisor in the department.

The schedule is more complicated than that might sound, though. While some lines are prioritized for cleaning only every five years, others are on more frequent schedules, whether because of their configuration, age or particular wastewater stream.

Flat lines, older clay lines and areas with heavy grease might be cleaned as often as once a month. Eight inverted siphons in the collections system are cleaned quarterly. Similar criteria are used to put segments of the system on one-, two-, three- or four-year cleaning cycles.

Regardless of when, however, the sewers are all cleaned by city

utility employees.

“We clean every sewer in-house from 6-inch to 60-inch,” Conn says. “That includes mains, interceptors and trunk sewers.”

The city's well-equipped for the work, with two Vactor combination trucks, a CUES TV inspection van, several portable RIDGID SeeSnake push cameras and a pole camera, along with an assortment of other pieces of equipment. Naperville uses Cityworks, Esri ArcMap and Arc Collector, and CUES Granite XP for asset management and sewer camera inspection software.

Naperville also has an in-house flow monitoring program, with a battery of 44 flowmeters. Some 23 of those are open-channel meters from ADS Environmental Services, says Conn, and ADS produces a report on those meters' findings every six months. The rest are closed-pipe Foxboro flowmeters (Schneider Electric); the data from those units is analyzed in-house monthly.

That data is used to help maintain pump stations, forecasting wear on pump impellers so the city ensures the pumps are in tiptop shape.

So far, it seems to be working, Conn says. “We haven't had a pump failure since 1994.”





**Top:** Utility technician Wally Thome remotely drives and monitors an OZIII camera while inspecting a sewer line from the control room of the CUES TV truck. **Bottom:** Technician Terald Brue checks on a Triton Flow Shark (ADS Environmental Services) used to monitor flow conditions including depth, speed and temperature.

Those laterals aren't due for lining now, however, so the city is bypassing that step, sticking with its current priority list for parts of the system to be lined. And if the pilot project is successful, the city will proceed with grouting joints on the rest of that section's laterals over a four-year period. These laterals will be lined in the future as a separate procedure, Conn says.

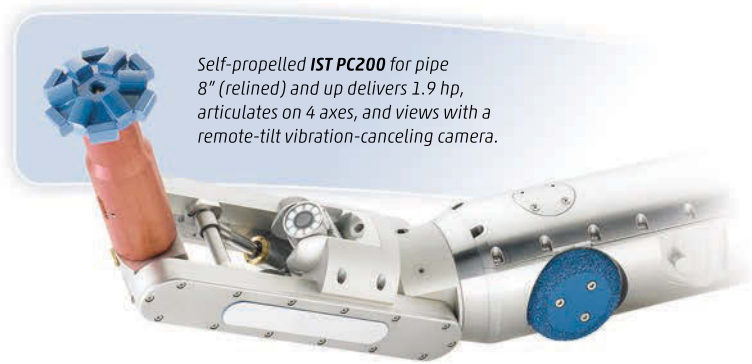
### Not resting on laurels

The experience with grouting has led Conn to a balanced perspective on the many different ways to combat I&I. "I consider lining a sewer main as just one of the tools in your toolbox for I&I reduction," he says.

With a focus on I&I as well as on regular maintenance, Naperville has much to show for its efforts.

"We don't have dry-weather-related wastewater backups," Conn points out. And then there were those two rate increases — 3 percent each — the utility canceled that Naperville's ratepayers won't have to pay.

In time, Conn hopes the city's I&I program will minimize the effects of heavy rain or flooding events. In the meantime, Naperville will keep doing whatever it can to tighten up its system. ♦



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# WIRELESS MAPPING

Smart device compatibility of RIDGID SR-24 improves locating accuracy and saves time

By Craig Mandli

Smartphones, tablets and GPS devices are becoming everyday tools in the workflow of locating professionals. With an understanding of this dynamic, RIDGID has integrated wireless and mapping functions into a new underground locator – the SR-24 – unveiled at the 2015 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show.

The SR-24 essentially adds wireless and GPS features to the company's popular SR-20 utility locator. It uses wireless Bluetooth communication to connect to external devices such as GPS units, compatible signal transmitters and smartphones. The free RIDGIDtrax app makes most smartphones and tablets compatible, visually displaying GPS line traces in real time.

"It was designed to easily replace inaccurate hand sketches and drawings, creating a digital representation of pointers underground," says Eric Huber, senior product manager with RIDGID. "Not only does the system leverage tools that most professionals likely already have, it allows them to quickly share accurate information with customers."

The mapping features can be utilized in several ways. The SR-24 connects wirelessly to most high-accuracy submeter GPS hand-held devices with Bluetooth. In this mode, the GPS hand-held device is the primary data capture point to obtain the most accurate position information, obtaining depth and signal information wirelessly from the SR-24.

The unit has its own GPS antenna for applications that do not require detailed submeter position information. It has a nominal accuracy of less than 8 feet and gets more accurate with clear line of sight to GPS satellites overhead. This level of location resolution can be used to create reference maps of underground assets, but not exact dig points. It records GPS and locating information on its onboard microSD card at the press of a button. The universal KML file created can be viewed on GIS mapping programs such as Google Earth.

"It enables the operator to go back to the exact spot they need to after mapping is complete," Huber says. "This system is going to appeal to utility and municipal excavators, utility locators, plumbers and even facility maintenance crews."

The RIDGIDtrax app enables operators to view positional information in real time to document underground assets. Just select a utility type and record "digital yellow paint" as you walk the line. The finished KML map is easy to share by email for quick viewing, providing an easy way to document the layout and depth of underground lines.



**RIDGID Territory Manager Joe Borneman (left) explains the features of the SR-24 underground locator and RIDGIDtrax app to an attendee at WWETT 2015. The locating system offers compatibility with smart devices. (Photo by Craig Mandli)**

"We did demos for RIDGIDtrax almost constantly at the WWETT Show this year," Huber says. "It was an extremely popular attraction for us, especially when people saw how it integrated with products such as the SR-24."

The unit is also compatible with the ST-33Q+ signal transmitter, which can be controlled remotely from the SR-24 keypad up to 200 yards away. Eliminating the need to walk back to the transmitter to change frequencies and power settings saves time during difficult locates, a feature that Huber says came directly from customer feedback.

"Our goals attending shows like WWETT are not only to get our new product info out, but also to solve problems that techs deal with in the field," he says.

Huber was thrilled with the turnout at WWETT 2015 and promised that RIDGID would be back with several new developments in 2016.

"This is really our target audience and core customer base," he says. "It's such a huge show for the plumbing and drain cleaning profession. It's a huge date on our calendar." 800/769-7743; [www.ridgid.com](http://www.ridgid.com). ♦



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# Education Day Sessions

Wednesday, February 17, 2016

## NAWT

National Association of Wastewater Technicians  
Rooms 234-236

- 8 a.m. Basics of Septic System Control Panels
- 9:30 a.m. Using Septic Control Panels to Troubleshoot Systems
- 11 a.m. Inspecting Concrete Sewage Tanks
- 1:30 p.m. An Exercise in Septic System Troubleshooting
- 3 p.m. The Basics of Inspecting Drip Systems
- 4:30 p.m. NAWT Ask the Experts Panel Discussion

## SSPMA

Sump and Sewage Pump Manufacturers Association  
Rooms 133-135

- 8 a.m. Understanding Pumps and Common Pumping Issues
- 9:30 a.m. Evaluation and Installation of Backup Pump Systems
- 11 a.m. Best Installation Practices for Trouble-Free Pump Controls
- 1:30 p.m. Troubleshooting Pumps, Panels and Switches with Digital Multimeters
- 3 p.m. Sizing Guidelines for Sump, Sewage and Grinder Pumps
- 4:30 p.m. SSPMA Ask the Experts Panel Discussion

## Business Strategies

Rooms 140-142

- 8 a.m. How Much Should I Charge?
- 9:30 a.m. Business Game Changers: Top 5 Secret Strategies for Massive Growth in Your Service Business
- 11 a.m. The Un-Business Plan — Making Your Business Less Complicated But More Profitable
- 1:30 p.m. How to Use Superior Customer Service to Increase Sales
- 3 p.m. Reward the Right Stuff: Finding, Training and Keeping Great Team Members
- 4:30 p.m. Is Your Business Prepared for a Crisis?

## Industry Safety Track

Rooms 237-239

- 8 a.m. Pre-Engineered Shoring Systems for Cross-Trench Utility Challenges
- 9:30 a.m. Excavation Safety
- 11 a.m. OSHA Confined Space, Air Monitoring and Fall Protection Explained

## SSCSC

Southern Section Collection Systems Committee  
Rooms 231-233

- 8 a.m. Positioning Yourself for Promotion and Succession Planning
- 9:30 a.m. Step Up Your Game! Taking Current CCTV Inspection Technology to the Next Level
- 11 a.m. Trailer Jetting — Getting the Most Out of Your Equipment
- 1:30 p.m. Vacuuming: the Other Half of the Combination Unit
- 3 p.m. Sewer System Maintenance — Challenges and Solutions
- 4:30 p.m. SSCSC Ask the Experts Panel Discussion

## NOWRA

National Onsite Wastewater Recycling Association  
Rooms 240-242

- 8 a.m. Introduction to Soils
- 9:30 a.m. Onsite Septic System Loading Rates and Site Layout
- 11 a.m. Making Infiltration Decisions — Understanding Soil Surface Design
- 1:30 p.m. Soil Dispersal Comparison
- 3 p.m. Introduction to the Elements of Onsite System Design and Regulations
- 4:30 p.m. Onsite Septic System Hydraulics and Pump Design

## Portable Sanitation Track

Rooms 136-138

- 1:30 p.m. Marketing Basics: How to Effectively and Efficiently Grow Your Portable Sanitation Sales
- 3 p.m. Portable Sanitation Forum: Current and Future Critical Issues Affecting the Industry Discussion
- 4:30 p.m. Trust — How to Build it and Use it to Grow Your Portable Sanitation Business

## NASSCO

National Association of Sewer Service Companies  
Rooms 130-132

- 8 a.m. Cleaning Nozzle Technology
- 9:30 a.m. Large vs. Small-Diameter Pipe Cleaning
- 11 a.m. The Lower Lateral — The New Frontier in Sewer Rehab
- 1:30 p.m. Chemical Grouting Technologies
- 3 p.m. The Growth of the UV Cured CIPP Process
- 4:30 p.m. NASSCO Ask the Experts Discussion Panel

## Treatment Plant Operator Track

Rooms 243-245

- 8 a.m. Effective Strategies for Collections System Management
- 9:30 a.m. Sustainable Innovation in Biosolids Management
- 11 a.m. Pretreatment and Wastewater Lagoon Management
- 1:30 p.m. Septage Collection and Treatment
- 3 p.m. Large Scale FOG/Septage Receiving Station — Lantern Environmental Project Case History
- 4:30 p.m. Progress in Electrochemical Water Treatment in Last Century

## WJTA-IMCA

Water Jet Technology Assoc. - Industrial Municipal Cleaning Assoc.  
Rooms 237-239

- 1:30 p.m. Proper Industrial Truck Maintenance Can More Than Pay for Itself in Productivity and Safety
- 3 p.m. Air Conveyance Through an Industrial Vacuum Truck
- 4:30 p.m. Vacuum Excavation Applications and Opportunities

## Women in Business

Rooms 136-138

- 8 a.m. Marketing to Women
- 9:30 a.m. Women of Wastewater: Building a Community of Allies
- 11 a.m. Women in Wastewater Roundtable

## Vacuum Truck Equipment and Operation Training

presented by NAWT National Association of Wastewater Technicians

Rooms 109-110 8 a.m. - 5 p.m.

This day-long session will discuss in detail the equipment on vacuum trucks and how to operate them. Pumping terms will be covered, as will safety principles, materials often encountered on the job and government regulations.





# WWETT Education Sessions

Thursday, February 18, 2016

## Liquid Waste Treatment & Disposal

Rooms 130-132

- 8 a.m. Analysis of Drainfield Failures and Restoration Methods
- 9:30 a.m. Cash In on Community System Operations and Maintenance
- 11 a.m. Ultra-Efficient Inspection Technique to Locate Leaks on Septic Systems

## SSCSC Sewer & Drain Cleaning Course

Rooms 231-233

- 8 a.m. Hands-On Nozzle Technology
- 10 a.m. Hands-On Jetter Hose Maintenance – Care and Repair

## Sewer & Pipe Rehabilitation, Relining & Repair

Rooms 234-236

- 8 a.m. Take Control of Inflow and Infiltration in Manholes
- 9:30 a.m. When Things Go Wrong on a Lining Job
- 11 a.m. Taking Small-Diameter Drain Lining Inside Infrastructure

## Sewer & Drain Cleaning, Inspection & Repair

Rooms 133-135

- 8 a.m. Using the Clean Water Act to Grow Profits
- 9:30 a.m. Winning Trench Warfare – Finding Profitability in Sewer/Septic Work
- 11 a.m. Your Best Shot at Sewer Success – How to Get the Most From Inspection Technology

## Onsite Septic Installation, Repair & Design

Rooms 237-239

- 8 a.m. Overview of Application, Design, Installation and Operation of Drip Dispersal Systems
- 9:30 a.m. Onsite System Pump Design Made Easy
- 11 a.m. The Onsite Wastewater Industry and Our Carbon Footprint

## Treatment Plant Operator

Rooms 243-245

- 8 a.m. Smart Water Technology in Theory and Practice
- 9:30 a.m. Dissolved Ozone in Municipal Collection, Treatment and Disposal
- 11 a.m. Municipal Biological Waste Treatment

## Business Strategies

Rooms 136-138

- 8 a.m. How Self-Employed People Can Make More Money
- 9:30 a.m. Growing Your Business in a Tough Economy
- 11 a.m. Staying in Front of Your Customer

## NOWRA Design Course

Rooms 240-242

- 8 a.m. Mound and At-Grade Design
- 9:30 a.m. Low-Pressure Pipe in Drainfield Distribution
- 11 a.m. Subsurface Drip Irrigation

## Municipal Sewer & Water

Rooms 140-142

- 8 a.m. How to Recover Non-Revenue Water
- 9:30 a.m. Phased Assessment Strategy for Sewers - Understanding Sewer Condition Quicker with Fewer Resources
- 11 a.m. The Science of Pipe Cleaning – Flow and Pressure



Many states approve WWETT education sessions toward fulfilling required certified education units or professional development hours.

See [wwettshow.com](http://wwettshow.com) for a list of approved states and courses.



## Friday, February 19, 2016

### Liquid Waste Treatment & Disposal

Rooms 130-132

- 8 a.m. | Fact vs. Fiction: The Top Ten Septic Myths
- 9:30 a.m. | All About Facultative Bacteria
- 11 a.m. | Brown Grease Recovery From Grease Trap Waste: Science and Economics

### Industry Safety

Rooms 140-142

- 8 a.m. | Identifying and Managing Risk in a Septic or Sewer Business
- 9:30 a.m. | How Well Do You Know Your Cleaning Hose?
- 11 a.m. | Pathogen Exposures to Workers in the Onsite Industry

### Business Strategies

Rooms 240-242

- 8 a.m. | Creating a Data-Driven Strategic Marketing Plan
- 9:30 a.m. | What Every Sewer and Drain Contractor Needs to Know About Asset Protection, Tax Reduction and Estate

### Municipal Sewer & Water

Rooms 240-242

- 11 a.m. | GIS: Empowering Water, Wastewater and Waste Removal Organizations

### Sewer & Drain Cleaning, Inspection & Repair

Rooms 133-135

- 8 a.m. | Advanced Pipe Bursting
- 9:30 a.m. | Low-Latency, High-Definition Video Over Coaxial Cable for Remote Inspection
- 11 a.m. | Plumbers vs. Technicians: The Slow Decline of the Tradesman

### Municipal Sewer & Water

Rooms 231-233

- 8 a.m. | Using Acoustic Inspection to Prioritize Sewer Cleaning
- 9:30 a.m. | Evaluation of Automatic Filters for Nozzle Protection in Flow Monitoring — How to Make Your Program Successful
- 11 a.m. |

### Treatment Plant Operator

Rooms 243-245

- 8 a.m. | Insights into Ozone Water Treatment Plants
- 9:30 a.m. | Wastewater Microbiology
- 11 a.m. | How to Ensure Gold is the Result — Choosing the Right Dewatering Equipment

### Business Software & Technology

Rooms 136-138

- 8 a.m. | Know the State of Your Business Using Business Charts and Reports
- 9:30 a.m. | Using Software to Save Time and Increase Profits
- 11 a.m. | Using Mobile Devices for Business

### Sewer & Pipe Rehabilitation, Relining & Repair

Rooms 234-236

- 8 a.m. | Buying Back Capacity
- 9:30 a.m. | Successful Reduction of I&I Using the Holistic Approach to Sewer Rehabilitation
- 11 a.m. | Large Scale Centrifugally Cast Concrete Pipe Culvert Rehab in CO Dept. of Transportation Region 1

### COLE Publishing's Onsite Installer Course

Rooms 237-239 8 a.m. - 5 p.m.

This day-long session will walk professionals through an introduction to proper installation practices for the sustainable use of onsite treatment systems



Detailed session information available at:  
[www.wwettshow.com](http://www.wwettshow.com)





# DRIVEN BY DATA

Idaho utility's commitment to GIS mapping is driven by two goals — achieving system efficiency and taking possession of its own data

By Peter Kenter

City of Ammon water department employee Brandon Russell gathers GIS information from the city's distribution system. (Photography by Jeff Smith)

Ammon, Idaho, is a small city with a big appetite for progress. The municipality is linked by city-owned fiber optic infrastructure, and efforts to create geographic information system maps of sewer and water infrastructure are well underway.

How does a small community with a limited budget take on such massive challenges? It's a combination of the efforts of dedicated staff members, cooperation between city departments and the willingness of stakeholders to demonstrate expected return on investment.

## Double the size

"The city doubled in size between 2000 and 2010," says Bruce Patterson, technology director with the City of Ammon. "But our information systems hadn't kept up. We had three different SCADA systems and they didn't talk to each other."

Ammon was also outsourcing management of its SCADA system database, paying a license fee for each data point added to the network.

"Our Public Works Director Ray Ellis wanted

to see one single SCADA system for everything from water to wastewater," Patterson says. "We decided that whatever we did, we wanted to be stewards of our own data instead of paying service providers to manage it. We were committed to avoid investing in dying standards and we wanted to build a modern system, not just compared to other utilities, but to the state of the art of the technology available."

The city decided on Ignition SCADA software by Inductive Automation, underpinned by a reliable city-owned fiber optic network that would not only serve the city's public utilities, but also emergency services, residents and businesses. However, Patterson wanted to ensure that the city's fiber network had reliable GIS data to delineate its location. The Information Technology Department soon advertised a part-time data entry position with a GIS component using FiberBase software.

## GIS a specialty

Enter Carol Ellison, GIS specialist with the City of Ammon, who had recently embarked on a sec-

ond career in GIS mapping.

"I have always loved maps," she says. "I think they're beautiful. One day at work in a clerical position I found a copy of an Esri magazine on the floor. I read it and was so excited by the idea of combining my love of maps with technical skill that I enrolled in Idaho State University for earth and environmental systems with a core in remote sensing and GIS applications."

Ellison was hired part time to begin GIS mapping of fiber in early 2012. However, since the city Engineering Department had already purchased Esri ArcGIS software, Patterson, Ellis and City Engineer Lance Bates agreed to share costs and transform her job into a full-time position, which would involve GIS mapping the entire water and wastewater infrastructure.

"They could see benefits for the entire city," says Ellison. "For that reason, it would be important that we create a system that every city department could access. However, for a small city, budget is everything, so we wanted to proceed at

(continued)



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as low a cost as possible. The opportunity to build something like this from the ground floor is rare, so I wanted to do it both effectively and cost-effectively.”

Ellison began with aerial maps of the city that had already been purchased by the Engineering Department.

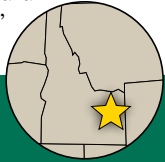
### Merging data islands

“We didn’t have as-built information on most of the system, and even drawings of the water and wastewater systems were islands that never crossed paths,” Ellison says. “The human knowledge base was also declining as people retired. If we had drawings, we couldn’t necessarily interpret them accurately. We essentially started at ground zero, but a survey company had already provided digital survey data for a water system improvement project that just happened to include GIS components, including digital data points, basic pipe and manhole locations and elevations. The digital format allowed us to incorporate our GIS data directly into the digital survey map so we could refine it and incorporate corrections, making it our own.”

Ellison next compiled and incorporated other available data, including GIS coordinates collected by Bonneville County for first responders.

With budget in mind, she worked with Public Works to devise a system of GIS data collection that would take advantage of what field workers were already doing.

“Ray wanted to base data collection on a work order system so that every time field workers would complete a work order, they would also collect or correct GIS data,”



## PROFILE: Public Works, Ammon, Idaho

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1940

**POPULATION SERVED:**  
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**AREA SERVED:**  
7.5 square miles

**DEPARTMENT STAFF:**  
14

**INFRASTRUCTURE:**  
Sewer: 70 miles; Water: 70 miles

**ANNUAL DEPARTMENT OPERATING BUDGET:**  
Sewer: \$2.5 million; Water: \$2.5 million

**ASSOCIATIONS:**  
American Water Works Association, Idaho Rural Water Association, Association of Idaho Public Works Professionals

**WEBSITE:**  
[www.ci.ammon.id.us/waste-water](http://www.ci.ammon.id.us/waste-water)



**Technology Director Bruce Patterson and GIS specialist Carol Ellison check a monitoring system at the city’s water department.**

Ellison says. “This way we would eventually collect all of the data we needed, using only incremental extra effort by staff.”

Ellison and her team selected Field Mapplet by Spatial Wave Software, a GIS-enabled mobile computing platform to allow field staff to input data on pipes, valves, meters and manholes using laptops or tablets.

“One of the advantages of Field Mapplet is that it could easily incorporate our existing GIS data,” she says. “When field workers see something incorrect they redline the location on the application and correct the data, adding notes about what they see. If they’re turning a valve, they can also electronically attach the associated work order to create a report on the number of maintenance and service calls associated with any infrastructure. Our field workers have quickly risen to the challenge of adapting their routines to include GIS data gathering.”

### Metrics for success

What are the metrics for the GIS program’s success?

“They’re difficult to quantify and they may be different for each department,” Ellison says. “It’s often easier to measure return on investment in a private industry where there’s a profit statement at the end of each quarter.”

However, some departmental stakeholders are seeing benefits sooner than others.

“The GIS system is still relatively young and yet we can see its value already,” says Bates. “The efficiency of retrieving information about infrastructure improvements and providing that to developers and citizens is greatly improved. The ability to provide a visual map rather than trying to write a description is worth a thousand words. As the system improves, other layers of information become available, which will serve the public and the private sector equally.”

*(continued)*

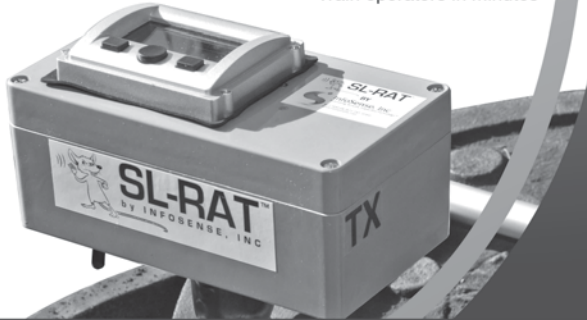




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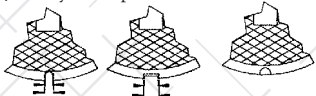
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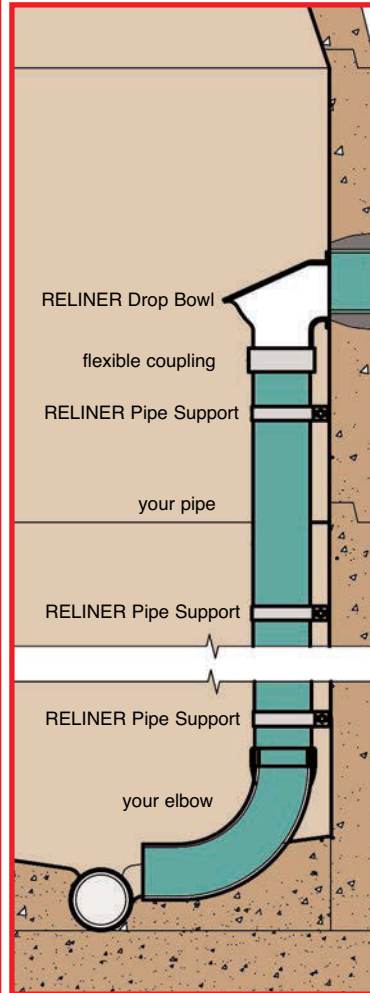
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**Ammon, Idaho City Engineer Lance Bates, GIS specialist Carol Ellison, Public Works Director Ray Ellis, and Technology Director Bruce Patterson (from left) at the Founders Pointe Hill Tank and Pump Station.**

## SYSTEM SNAPSHOT

The City of Ammon operates a diverse water and wastewater system that is already benefiting from a solid geographic information system mapping program.

Ammon's Public Works Director Ray Ellis notes that the system contains a little of almost every material used to build water and wastewater pipes — except wood. Water pipes range from 2 to 18 inches in diameter, while sewer pipes range from 4 to 32 inches in diameter.

The system's wastewater pipes were installed between 1974 and 2012 and its water pipes between 1940 and 2010.

"The general condition of our sewer system is good since most of the infrastructure is within its expected life cycle," says Ammon City Engineer Lance Bates. "There are small areas that have been identified as needing attention, and those are being planned for improvement. The water system in the older parts of town is past its expected life cycle and a steady stream of issues is dealt with as problems arise. A more detailed and in-depth repair and replacement plan is currently being put together that can address these as a systemwide goal rather than a short-term fix. The rest of the water system is in very good condition since a large percentage has been installed in the last 10 years."

Sewer cleaning and CCTV inspection is performed by in-house staff from quarterly to triannually, depending on the location of the pipes. The city owns its own Envirosight inspection van and Vactor combination truck.

Minor repairs to the system are also handled in-house while larger repairs are contracted out.

"The GIS system is still fairly new and is not playing a major role in repair and replacement priorities yet," Bates says. "However, as we add data over time, the role of GIS in these processes will increase dramatically."



Ellis cautions smaller municipalities that patience is a virtue when waiting to see expected return on a GIS investment.

"We don't yet see the advantages much in day-to-day operations," he says. "From my view, the GIS and system documentation will pay dividends as projects are developed for upgrades and replacements because the engineering research is readily at hand. It will also prove valuable as we move ahead because of the electronic documentation of maintenance history."

### CSI Ammon

In one recent instance, GIS data has already proved invaluable.

When the Oxbow Wastewater Treatment Facility expressed concern that Ammon might be contributing more than its share of fats, oils and grease to the plant, the city presented an iron-clad defense, backed up by GIS data.

Operated by the Eastern Idaho Regional Wastewater Treatment Authority, the plant is located a dozen miles southwest of Ammon, in the City of Shelley, and also serves neighboring counties.

"The underlying issue was odor," Ellis says. "It was assumed by the Oxbow treatment plant that it was FOG related."

Ellison helped defend the city's reputation by providing aerial imagery married to city GIS data.

"We were able to provide data points to identify every possible avenue for FOG produced by Ammon to enter the wastewater system," she says.

Public Works next compared its own meticulous records to the data points.

"We regularly sample and test for FOG both using in-house resources and through independent labs," Ellis says. "Visual inspection, CCTV

inspection and flow testing showed that solids were not remaining in suspension in our wastewater stream. In short, we had the personnel, the skills, the equipment, procedures and documentation to prove that we run a top-notch wastewater collections system and were not the source of the odor problem."

Ellison says she continues to note improved functionality of the GIS system as it matures.

"I'm feeling a lot better about our GIS data every day as we verify it," Ellison says. "We've even provided corrected GIS data to Bonneville County, allowing first responders greater geographic precision in responding to calls."

Ellison's advice to smaller communities attempting a similar GIS program: "Start small and then work toward greater and greater precision with the collaborative effort of your team, even though the final goal may be years away. The more eyes that examine that data and add their perspectives, the more valuable the data will become. We're all stewards of the data of our city, and that's a sacred trust." ♦

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# GROUT KEEPS THE WATER OUT

With established standards, better products and evolving application techniques, grouting is gaining ground in municipal collections systems

By Erik Gunn



A National Power Rodding crew member lubricates a Logiball lateral packer at the start of a grouting job in Naperville, Illinois. Right: The five-line grouting hose includes two air lines, one vacuum line and one line for each of the two grout components.

Grout is coming into its own as a remedy for collections system inflow and infiltration.

The types and specific uses for grout have never been more diverse. And with national standards for grouting now well established, municipalities and contractors have never had better guidance for when and how to grout or what materials to use.

Yet it's still a lesser-known option for municipal I&I prevention. Methods such as cured-in-place pipe lining have gotten a lot of attention, and deservedly so. But the benefit of using grout to supplement CIPP has gotten lost in the shuffle, says Tony Conn, wastewater collections and pumping supervisor at the Department of Public Utilities for the City of Naperville, Illinois.

Naperville has seen substantial I&I reduction since it added grouting to its protocols for CIPP lining to repair mains and laterals two years ago.

**“In the last five to seven years, grouting has become very, very beneficial to a lot of municipalities, saving them a lot of money.”**

– Pam Sawatzke

“It seems like there’s not a whole lot of understanding of what lining can and cannot do,” Conn says. “You really do need to incorporate grouting in your lining program, and there’s not a whole lot of advertising” aimed at pointing that out, he adds. “Grouting companies need to start advertising lining and grouting as a combination.”

Grouting isn’t only useful as a supplement, however. “It’s becoming more and more of a stand-alone practice,” says Michael Vargo, a senior technical consultant with Prime Resins, based in Conyers, Georgia. Depending

*(continued)*





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on the situation, grouting can be conducted as an independent operation or it can be used in conjunction with lining and spincast manhole repairs.

Word about grouting's benefits may be starting to get out. "In the last five to seven years, grouting has become very, very beneficial to a lot of municipalities, saving them a lot of money," says Pam Sawatzke, general manager for sales and marketing at Sealing Systems Inc., based in Loretto, Minnesota. That savings comes from reducing the volume of liquid flowing to the treatment plant by keeping out I&I, but also because, relatively speaking, grouting is a lot less expensive than some other approaches.

When it comes to I&I repair, grouting "is the least-cost, highest-reward technology," says Don Rigby, vice president of marketing and education for Avanti International.

Grout in some form has been on the market since the 1950s. Initially conceived as a means for improving soil structure to support underground lines, grout began to be looked at as a possible pipe sealant starting in the 1960s.

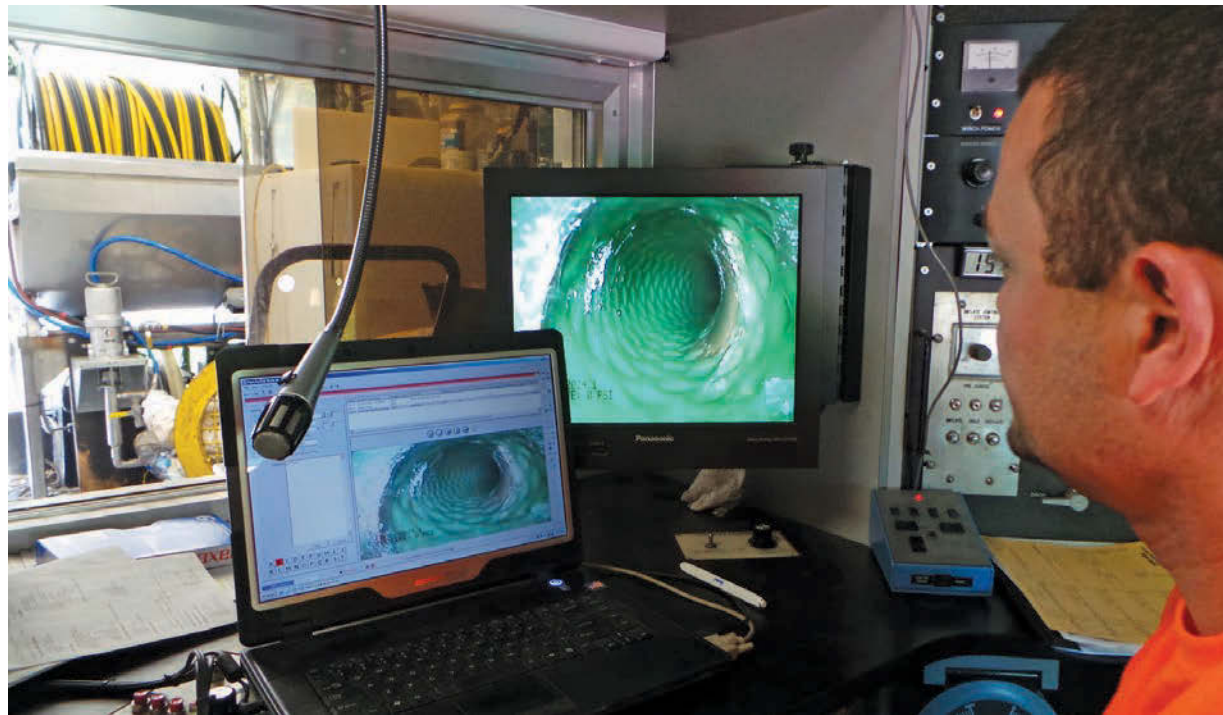
Rigby says the first decade or so after that was a time of tentative experimentation, as engineers and sewer repair experts explored grout's capabilities. Experimentation flourished over the next three decades, but the results were often very uneven because the industry had no standards or regulations.

In the last 10 years, that "Wild West" culture, as Rigby calls it, has matured considerably. There has been extensive testing to determine the most effective amounts, types and application methods of grout for various purposes. That culminated in 2012 with the development of industry standards for using grout in sewer line repair, promulgated by NASSCO in cooperation with the Infiltration Control Grouting Association, an industry group.

### Types of grout

Grouting by itself is best suited to combating infiltration, says Vargo of Prime Resins. "If a manhole is structurally sound and the issue is strictly infiltration, grouting is the only step needed to protect that manhole. Chemical grouts are not for structural repairs. You can't rely on them for any structural integrity."

There are a number of varieties of grout. The two broadest categories are cement-based and chemical grouts. Although cementitious grouts still have their uses and are by far the least expensive material, they're rigid. If there's any likelihood of movement or shifting in the infrastructure being



**A National Power Rodding crew member works from the command and control center in the grout truck. The monitors provide separate views of the work area (right) and what's already been grouted.**

grouted, they're vulnerable to cracking and producing a new leak all over again, Vargo says.

Chemical grouts are made of polyurethane or acrylic, or occasionally other materials. Within that category are numerous subcategories. The two broadest are hydrophilic (water compatible) and hydrophobic (water averse). Hydrophilic grouts can bond to wet materials such as concrete in a manhole or at the boot seal where pipe connects to the manhole, Vargo says. Hydrophobic will not.

Hydrophobic grouts also tend to be rigid, while hydrophilic grouts are more flexible. A hydrophobic grout might be used to fill a void or pocket outside a leaking structure — in the earth surrounding the manhole, for example — as long as the area isn't actively wet from leaking. If the leak to be repaired is actually inside the structure of the pipe, the hydrophilic grout will be more effective, Vargo says.

Thanks to their flexibility, hydrophilic grouts are also more effective where the infrastructure is subject to significant shifting. That also makes them a good companion to compression seals for repairs.

Another way to categorize grouts is based on their reaction time. Slow-reacting grouts are used to repair leaks that are relatively small and often more out of the way, explains Sawatzke of Sealing Systems Inc.

Fast-reacting grouts are for fast, heavy leaks. "If you have a 20 gpm leak, you're going to want something that sets up rather quickly to stop that water immediately," Sawatzke says.

Another differentiation is between single-component and dual-component grouts, she adds. The faster grouts are usually of the dual-component type, which is a focus of Sealing Systems' product line.

### Application

Grout is applied in a number of ways depending on the type and usage. A typical approach for manhole grouting requires drilling a hole through

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Grouting crew members guide the lubricated lateral packer to a manhole in Naperville, Illinois.

the manhole structure in order to apply grout to the outer portion of the structure, Sawatzke says. That requires care and precision to ensure that the grout applicator actually gets all the way through to the outside surface of the structure, where it will do the most good.

In other situations, crews apply grout with a portable electric pump that sprays it into place, says Vargo. In some situations, an even more basic technology will suffice, he adds — “as simple as a cartridge that fits a standard caulk gun.”

For some manhole grouting, utilities aiming to prevent hazards to their employees have started using application techniques that keep workers outside the manhole structure. “They’ve gone to grouting their manholes by doing it from the exterior,” Vargo explains. Grout can be injected around the outer perimeter of the manhole structure through probes placed in the ground from the surface.

Avanti’s grouting products for sewer line and lateral line joints are applied using machinery that resembles wheel-mounted sewer cameras, except with grout application machinery instead of cameras. The rolling grout packers are built by Aries Industries, which has been working with Avanti to develop and market the system.

The application packers are inserted into the sewer line as a camera would be, except that instead of video cables that extend back to the control truck, they are on the end of a bundle of control cables that include tubes carrying the grouting material. An Aries pan-and-tilt sewer camera is also used to monitor the process.

When the packer reaches a failed joint or other segment of the pipe needing repair, the operator stops the unit, inflates bladders at the front and rear of the packer to isolate the repair site, and then pumps grout into the opening that needs to be sealed. Rigby explains that the grout is pumped out in sufficient amounts to form a sort of collar around the outside of the pipe at the failed joint. The grout “forms a matrix with that soil that is an impermeable barrier,” he says.

### Making the case

Among the strongest arguments for grout as an I&I remedy is its cost. “When it comes to leak sealing, the biggest thing is return on investment,” Vargo says. Municipalities that use grout properly find that “for a couple thousand dollars’ worth of grout, they can save a large amount of money.”

Even if a system may need to ultimately employ other techniques such

as lining, grout can effectively stop major sources of I&I and buy the utility or municipality some time until the budget allows for more expensive repairs, he adds.

Vargo and Rigby both have encountered the same misconception about grout — that it doesn’t last. “In the earliest days there were a lot of installations that weren’t done properly,” Vargo says, noting that created the impression that grouting was only temporary. In fact, grouting can be a permanent repair, “provided it’s properly installed,” he says.

Rigby sums up the common misconception in one word: “Longevity,” he says. “The belief that grouting is a temporary process.” Utility engineers view it as temporary, when in fact it can be a “long-term permanent cure.”

A 20-year study by the U.S. Department of Energy gave acrylamide grout the top rating for its ability to contain hazardous nuclear waste buried underground, Rigby says. So far, though, the material simply hasn’t been in place long enough to convince some engineers of its long-term stability and reliability. But he’s confident that will happen eventually.

“What we now have are guidelines for how to do this,” Rigby says. “You have the same results each and every time. Grout is chemistry, and it does the same thing every time.” ♦

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# STRENGTH THROUGH COLLABORATION

UESI and NASSCO share mutual objective to support trenchless technology

By Ted DeBoda, P.E.

As the demand for quality underground infrastructure grows, organizations like NASSCO are answering the call through the development of valuable resources, improved education and stronger industry collaboration.

In August, I spoke about the value of NASSCO's partnerships with some of the outstanding organizations out there like the Water Environment Federation, Louisiana Tech's Trenchless Technology Center, and the Center for Underground Infrastructure Research and Education at the University of Texas Arlington. The American Society of Civil Engineers joins this growing list of industry partner associations, and has taken a proactive step to unify the industry by unveiling a new institute focusing on utility engineering and surveying.

The newly formed Utility Engineering and Surveying Institute (UESI) was introduced at the ASCE Pipelines 2015 Conference in Baltimore in August and will step up the efforts of the former ASCE Pipelines Division. Created to bring together professionals engaged in utility and pipeline infrastructure engineering, planning, design, construction, mapping, coordination, operations, and asset management, UESI is ultimately a resource focusing on all utility pipelines, regardless of the products they transport.

"Civil engineering professionals working within the utility engineering and surveying communities need a recognizable home which they can join to collectively work to improve our professions," says UESI's first president, Randy

Hill, P.E., FASCE. "UESI is now that home, and we thank the Board of Directors for its careful deliberation and vote of confidence."

By centralizing utility and pipeline engineering and surveying professionals into a single institute, UESI hopes to become the leader in standards development, manuals of practice, and educational opportunities for state-of-the-art engineering practices in utility engineering and surveying.

NASSCO supports the UESI vision through our mission to set standards for the assessment and rehabilitation of underground infrastructure and to promote the continued acceptance and use of trenchless technologies.

This collaboration opens up many doors for inter-association initiatives. Specifically, it is my hope that UESI and NASSCO can join forces — as we do with many other organizations — to improve training quality and expand opportunities to educate and inform as many professionals as possible.

Initiatives may include the joint publication of the new CIPP Manual of Practice, online training to support the industry, and events to bring professionals together in order to share valuable information.

Many of NASSCO's members are currently active in ASCE Pipelines and I strongly encourage continued collaboration with UESI and other like-minded organizations to help us identify areas in which we can collectively improve and grow our industry to set standards which benefit us all. To learn more about UESI, visit [www.asce.org/uesi](http://www.asce.org/uesi). ♦

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## LOCATION AND LEAK DETECTION

By Craig Mandli

Locating lines and the sources of infrastructure leaks needs to be done quickly. These dyes, electronic leak detectors, utility line locators, push cameras, smoke locators and transmitters can help.

### DYES



#### BRIGHT DYES

Concentrated leak inspection dyes from **BRIGHT DYES** dissolve rapidly in water and provide a vivid fluorescent color detectable in murky water, sewage or effluent. They can be used to identify leaks, infiltration and exfiltration in plumbing connections, validate sanitary and septic hookups, and perform septic inspections to identify leachfield issues as well as sources of contamination in wells. They are safe, nontoxic, biodegradable and certified by NSF International to ANSI/NSF Standard 60 for use in and around drinking water. They are available in fluorescent yellow/green, red and orange and non-fluorescent blue, in tablet, liquid or powder form. **800/394-0678; www.brightdyes.com.**

They are safe, nontoxic, biodegradable and certified by NSF International to ANSI/NSF Standard 60 for use in and around drinking water. They are available in fluorescent yellow/green, red and orange and non-fluorescent blue, in tablet, liquid or powder form. **800/394-0678; www.brightdyes.com.**

### ELECTRONIC LEAK DETECTION



#### Analytical Technology CI6 PortaSens II

The **CI6 PortaSens II** portable leak detector from **Analytical Technology** is used to check for gas leaks in storage areas, around process equipment and piping, and in confined spaces prior to entry. The detector contains an internal sample pump and a flexible sampling wand to allow pinpoint location of the source of leakage. It can be used to measure over 30 different gases by simply inserting the appropriate sensor into the detector. **800/959-0299; www.analyticaltechnology.com.**



#### Electro Scan ES-H2O 4-in-1

The **ES-H2O 4-in-1** from **Electro Scan** integrates closed-circuit television, an acoustic hydrophone, a pressure sensor and the company's scanning technology into a single multi-

sensor probe allowing for the identification of defects in pressurized water pipes of all materials. By using multiple technologies with different strengths and weaknesses, it can provide beneficial data about the location and size of defects as well as aid in eliminating false positives, more accurately and safely determining the condition of the pipe. Variations of electricity flowing through cracks, bad joints and defective connections are automatically recorded and transmitted to the PC-based application, as is data from the pressure sensor, hydrophone and camera. Upon completing the scan, all

data is instantly available on the Critical H2O Cloud, giving utilities and contractors immediate access to data such as accurate defect locations and measurements of exfiltration. **916/779-0660; www.electroscan.com.**



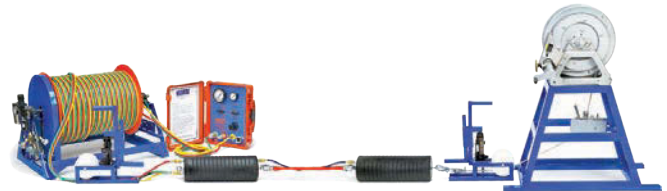
#### Fluid Components International ST50

Engineers who need to reduce the energy cost of air compressor systems will find the **ST50** airflow meter from **FCI - Fluid Components International** helps accurately measure compressed air and detect system inefficiencies or leaks. Its installation in large facilities with multiple air compressors allows the operators to compare compressor usage and adjust them for optimum efficiencies. The use of mass flowmeters at the point of compressed air output helps ensure peak performance at a given flow rate. Comparing the performance of multiple air compressors is useful in predictive maintenance applications where higher flow rates may indicate leaking valves or seals in one unit versus other units operating under similar conditions. Its flow range can be field-configured in either standard mass flow or volumetric engineering units. It has dual analog outputs, 4-20 mA and 0-10 Vdc, which are field assignable as flow rate or temperature and an RS232C I/O port. **800/854-1993; www.fluidcomponents.com.**



#### Fluid Conservation Systems Touch Pro

The **Touch Pro** correlator from **Fluid Conservation Systems** accurately locates leaks in traditionally difficult situations, such as on plastic or large-diameter pipes. Its intuitive interface with step-by-step instructions guides users through the correlation process with minimal training required. Acoustic data is transmitted back to the correlator from two outstations attached magnetically to valves at different points along the pipeline. The correlator then uses an automated filtering intelligence system (AFIS) to ensure an accurate interpretation. The AFIS automatically runs up to 55 different filter combinations on each correlation, checking the quality of the result and optimizing the filters to obtain the best possible result. The system can be used with both live and prerecorded correlation data, removing the need for a manual filter setting. Outstations offer long-range radio transmissions with clear sound quality. The correlator and outstations can be charged in the carrying case simultaneously from a single outlet. **800/531-5465; www.fluidconservation.com.**



#### Lansas Complete Leak Location Kit

**Complete Leak Location Kits** from **Lansas Products** include an air-motor-driven hose reel (manual hose reel is optional) that comes with 500 feet of color-coded triple-test hose and a three-way air swivel, and is mounted on a heavy-duty welded frame. The Manhole Winch with footage counter can precisely indicate where leaks are found in the pipe. Hydraulically actuated, heavy-duty manhole jacks will keep triple-test hose and winch cables from damage while in use. All the technician needs to do is select the appropriate size pipe plugs needed and begin testing. **800/452-4902; www.lansas.com.**





## MSA North America Ultima X Series

**Ultima X Series** gas monitors from **MSA North America** are designed to provide thorough, continuous monitoring of many hazardous gases and are suited to indoor and outdoor applications in virtually any industry including water and wastewater plants, mining and general industry. DuraSource Technology offers extended sensor life, while the HART Protocol provides convenient setup, calibration and diagnostics. A single circuit board

increases reliability, and the sensor disconnect-under-power feature allows all sensors to be replaced within hazardous areas without area declassification. Interchangeable smart sensors eliminate the need for reconfiguration. A scrolling LCD screen displays sensor reading and gas type, and the calibration process includes date stamping and the ability to calibrate locally or remotely. Approvals include SIL 2 Certification, NEMA 4X Rating, IP66, CSA, ANSI/ISA, cFMus and cULus. **800/672-2222; www.msasafety.com.**



## Radiodetection Corporation RD547

The **RD547** from **Radiodetection Corporation** is a single control unit capable of both acoustic and tracer-gas methods of water leak detection. For acoustic methods, it has high listening capabilities and supports three different microphones. Optimized for flexibility,

the universal microphone has a selection of attachments making it suitable for ground measurements or attaching to pipe fittings. The ground microphone (geophone) has a windproof shield for outdoor use and is sensitive to lower frequencies. A test rod with a rigid handle and extendable tips allows measurements to be taken on deeper-set utility fittings. When tracer gas offers a better option, a ground sensor for the detection of hydrogen can be attached. Six kit options are available. **877/247-3797; www.radiodetection.com.**



## Spire Metering Technology 280W-CI

The **280W-CI** commercial and industrial water meter from **Spire Metering** is an ultrasonic water meter, which means there are no moving parts to break and it retains its accuracy over the lifetime of the meter. It has quad path technology with eight different sensors to improve accuracy, increase tolerance to installation errors and reduce the straight pipe run requirements of typical ultrasonic meters. It can be used for district metering

areas for leak detection. It has a tamper-proof design and is not affected by water impurities. It can detect very low flows and comes AMR/AMI ready so leakages can be sent quickly to the central office without human intervention. **888/738-0188; www.spiremt.com.**

## 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 the continuous leak sounds even in difficult conditions, like busy streets. **775/298-2701; www.subsurfaceleak.com.**

## ELECTRONIC LINE LOCATORS



## Electric Eel XT512 Sonde and Camera Locator

The **XT512 Sonde and Camera Locator** from **Electric Eel** combines portability with the low-frequency sonde and passive locating capability. The user can locate and determine the depth of a sewer/pipe inspection camera or a small sonde, or blockages and obstructions in nonmetallic pipe. It has 512 Hz frequency mode operation, passive detection of 50 or 60 Hz and sonde, one-button depth measurement, digital readout display of signal strength (peak), audio and visual output, battery and sensitivity indicators, a 9-volt single battery with a battery life of 18 hours with intermittent use, and 3 1/2-inch digit reflective LCD display. The unit is ergonomic and lightweight at under 2.5 pounds. It is 26 inches extended and 15.5 inches retracted. **800/833-1212; www.electriceel.com.**



## MALA GeoScience USA Easy Locator HDR

The **Easy Locator HDR** from **MALA GeoScience USA** has a single-frequency transducer that allows the detection and imaging of targets. Users can zoom in for visualization of small, near-surface targets or out for maximum range to view the deepest targets. The detection limits span a broad range of various-size utility targets, particularly nonmetallic, nonconductive utilities such as plastic, asphalt composite, concrete and terracotta. It has a built-in DGPS receiver and upgradeable GPS mapper software for mapping utilities marked digitally. The screen-capture function allows users to turn screenshots into JPGs to record and archive a location on the screen. A rough terrain cart is available, as well as a portable, foldable version outfitted for urban streetscapes. **843/852-5021; www.malags.com.**



## Prototek LineFinder LF2200

The **LineFinder LF2200** from **Prototek** locates any frequency sonde or transmitter box between 16 Hz and 100 kHz using its frequency-sniffing feature. It has a preset support of 16 Hz (steel or ductile iron as well as cast iron and nonmetallic), 512 Hz (cast iron or nonmetallic) and 8 kHz (nonmetallic only) sondes. It traces underground metallic lines at four industry-standard frequencies using an external transmitter box; other frequencies can be sniffed as well. It passively locates underground power at 50 or 60 Hz. Power frequency and scaling in U.S. or metric units is selectable. The operator is guided through a series of LCD screens to locate both sondes and lines with accurate position, as well as precise depth. Locating is enhanced by handle vibration and LED feedback at key locating points, in addition to on-screen imagery. **800/541-9123; www.prototek.net.**



## RYCOM Instruments 8873

The **8873** cable, pipe, camera and sonde locator from **RYCOM Instruments** offers two versions of the dual active frequency packages — 512 Hz and 82 kHz or 512 Hz and 33 kHz — ensuring the ability to track any manufacturer's camera or sonde system operating on 512 Hz. It can be used to locate pinches and blocks in nonpressurized conduits and pipes, as sonde fre-

(continued)



quencies are matched to the frequency of the receiver. Sondes at all frequencies will trace through conduit up to 20 feet in the air or 10 feet in cast iron. The receiver pinpoints inspection cameras and sondes in nonmetallic conduits in a peak mode. A backlit digital display provides both relative and actual signal strength. A variable tone pitch gives an audio indication to the signal. The triple antennae configuration provides push-button depth accurate up to 15 feet and works in peak, pinpoint peak and null modes when used with a transmitter. **800/851-7347; www.rycominstruments.com.**



## Schonstedt Instrument Company XTpc+

The **XTpc+** multi-frequency pipe and cable locator from **Schonstedt Instrument Company** has a lightweight, compact receiver and 5-watt transmitter. The receiver operates at 512 Hz, 33 kHz and 82 kHz, with passive detection at 50/60 Hz and sonde detection at 512 Hz. It is powered up to 12 hours by a single 9-volt alkaline battery. It operates at a maximum depth of 19 feet in temperatures of -4 to 140 degrees F. The transmitter is powered by a rechargeable 12-volt NiMH battery pack that operates up to eight hours. It has a backlit white LED array and ambient light sensing. **800/999-8280; www.schonstedt.com.**



## Subsiti Electronics UtiliGuard

The **UtiliGuard** utility locating system from **Subsiti Electronics** automatically scans the surrounding area for noise and recommends the best frequency among its 70 options. To help users make more accurate locates of obstructed utilities, it measures distances (depth) both horizontally and vertically to the utility. To ease use, the system has an intuitive, six-button, multi-language operator interface and a high-contrast LCD display to ensure visibility in all conditions, including direct sunlight. Dual output allows users to connect the transmitter to two utilities at once, and the system is Bluetooth-enabled to simplify data transfers. Its housing with an IP65 rating protects against dusty, dirty and wet conditions, and its transmitter and receiver battery life are 100 and 30 hours, respectively. **800/846-2713; www.subsiti.com.**

## PUSH TV CAMERA SYSTEMS



## Amazing Machinery Viztrac II AM240-200

The **Viztrac II AM240-200** pipe inspection camera from **Amazing Machinery** has 200 feet of durable 1/2-inch push cable with a fiberglass rod inner core, a 20-inch cage reel and attached water-sealed case containing the controls, a high-resolution 7-inch LCD monitor and wheels to increase mobility. It also has a 1-inch, powder-coated, lay-flat frame with an upright rolling stand; a 1 3/8-inch O.D. metal camera housing; nine dimmable high-output 5 mm LED lights; high-resolution color camera with a self-leveling head; scratch-resistant sapphire glass lens; high-grade 512 Hz sonde locator with an average range of 12 to 15 feet; and an integrated digital video recorder with remote control, compatible with most standard SD cards. **800/504-7435; www.amazingmachinery.com.**



## CUES MPlus+

The **MPlus+** lateral and mini-mainline push system from **CUES** has a modular design that enables easy operation with an all-in-one setup. The control unit can be quickly removed to be used separately for off-road or remote job sites or to accommodate compact storage. The system incorporates video titling, video observation coding, digital recording and portability into an easy-to-use package. This lightweight system includes large and durable wheels for easy portability and a balanced footprint for stability. **800/327-7791; www.cuesinc.com.**



## Forbest Products FB-PIC3688

The **FB-PIC3688** pan-and-tilt pipe inspection camera system from **Forbest Products Co.** allows users to take panorama pictures with remote directional control for over 20,000 continuous hours. It comes with 400 feet of 9 mm fiberglass cable, a reel with a meter counter, and a 2-inch waterproof 360/180-degree pan-and-tilt high-resolution color camera head with zoom that can work up to 30 meters underwater. The heavy-duty waterproof control box includes a 10-inch LCD color screen with USB and built-in SD card for recording. The built-in rechargeable battery pack lasts about three hours. **650/757-4786; www.forbestusa.net.**



## Insight Vision Cameras IRIS

The **IRIS** Windows app-operated mainline crawler from **Insight Vision Cameras** can be used to inspect pipes from 6 up to 12 inches, and up to 18 inches with a larger wheel set. The ultra-portable and heavy-duty unit comes with 750 feet of advanced tether cable, pan-and-tilt, and a 10-inch LCD touch screen. The system includes a six-wheel-drive transporter and uses four powerful LED lights to illuminate a large area. The camera and transporter are controlled via a hand-held pendant. Video will display on the reel unit as well as to an external monitor via HDMI or a dedicated Wi-Fi-enabled Windows tablet, allowing easy file management and post-software reporting. **800/488-8177; www.insightvisioncameras.com.**



## RapidView IBAK North America POLARIS

The **POLARIS** camera system from **RapidView IBAK North America** has a three-axis range of movement for effective inspection of branching, small-diameter pipeline systems. The ability to pan and tilt is enhanced by the camera's pivot arm, which allows the operator to choose direction while moving through the pipeline and encountering tees and wyes. It keeps the pipe in clear view on the monitor and allows for laser measurement of pipe diameter and other observations. It has upright picture control, wide-angle view (plus or minus 120 degrees), powerful LED lighting and low-light sensitivity. **800/656-4225; www.rapidview.com.**





### Ratech Electronics Elite SD Wi-Fi

The **Elite SD Wi-Fi** pipeline inspection camera system from **Ratech Electronics** allows operators to record pipe inspections wirelessly to an iOS or Android device, and take digital still photos and live video that can be immediately uploaded to YouTube. No USB thumb drives, SD cards or DVDs are needed. Download the app to an iPhone or iPad and stream the video wirelessly. The Wi-Fi inter-

face is available on any current or existing Ratech system and is available with a sun-readable 10-inch LCD monitor and either a self-leveling camera, ultra microcamera or pan-and-tilt push camera. Systems come in cable lengths from 100 to 400 feet. **800/461-9200; www.ratech-electronics.com.**



### R.S. Technical Services Quick Peek

This **Quick Peek** video inspection system from **R.S. Technical Services** is a compact, lightweight solution for drainline condition assessment in lines 2 to 10 inches in diameter up to 300 feet in length. The unit has a 7-inch bright LCD handle-mounted monitor with a sun shield/screen protector that can be positioned for a comfortable viewing angle. Easily accessible monitor controls include power mode, aspect ratio (screen size) and menu, plus set buttons for color, brightness, contrast, tint and volume. The side-mounted AC/DC power source houses controls for all camera functions and provides a camera test terminal, AC/DC input, video/audio output, keyboard

input and a condenser microphone with on/off switch. Options include battery power, a self-leveling camera, 512 Hz receiver, roller skids, laptop interface, SD card reader and Wi-Fi interface. **800/767-1974; www.rstechserv.com.**

## SMOKE LOCATORS



### Superior Signal Model 20 Smoke Blower

The **Model 20 High-Output Smoke Blower** from **Superior Signal Company** blasts 4,000 cfm of smoke at 4.0 static pressure to push smoke through large systems requiring high volume and pressure. It fits all standard manholes, plus has a second outlet to blow into pipes and other openings. It can

be configured for use with smoke candles or smoke fluid to quickly and easily detect sources of surface inflow and other faults in sanitary sewer lines. It has an insulated heating chamber with a stainless steel injector to maximize dry smoke output, and high-quality liquid-based smoke. **800/945-8378; www.superiorsignal.com.**



### TURBO FOG M-45

The **TURBO FOG M-45** is a versatile, lightweight, portable, self-contained smoke generator capable of producing dense, voluminous white smoke using leak-proof liquid smoke cartridges. Each cartridge can be replaced in seconds, allowing quick and easy replacement even while the unit is operating, allowing for continuous uninterrupted smoke production. There is no

need to add additional smoke bombs or pumping garden sprayers for additional test time. The Briggs & Stratton-powered turbine-type blower is a lightweight 45 pounds and creates hurricane-force velocity with a discharge velocity of over 75 mph and 2,000 cfm. It continues to work under pressure in up to 5.75 inches of water. It is available with a plumbing conversion kit. **800/394-0678; www.turbo-fog.com.**

## TRANSMITTERS



### Echologics EchoShore

The **EchoShore** advanced technology platform from **Echologics** is designed to monitor water transmission mains. It is easy to deploy, simple to maintain and can be applied throughout transmission

systems on any pipe material. The system leverages components of Leak-FinderRT, creating a network that continuously monitors critical water transmission mains and alerts operators to leaks before they result in main breaks. The system collects data and uploads it to a secure server where it is analyzed to determine the location, with an alert then sent to the operator. The platform has a high degree of monitoring flexibility such as static pressure, flow, temperature, chlorine levels, acoustic anomalies and other operator requirements. **866/324-6564; www.echologics.com. ♦**

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### Advanced metering infrastructure helps track usage, find leaks



#### **Problem:**

After five punishing years, drought conditions have reached critical mass in California and much of the western United States, with Golden State utilities scrambling to meet government mandates for 25 percent reductions in water usage. The San Francisco Public Utilities Commission (SFPUC) needed a system to control water use and find leaks.

#### **Solution:**

The commission installed the **STAR** network from **Aclara** for reading meters hourly. The data collected from the city's 180,000 meters by Aclara's two-way fixed network powers the utility's system for letting customers track usage online. Aclara also generates a report that allows the utility to

identify customers who may have leaks inside their homes. "The Aclara report tells us which accounts have exhibited continuous usage every hour over a three-day reporting period each week," says Heather Pohl, automated water meter program manager for SFPUC. "We filter that report for single-family homes and analyze it to identify the minimum usage for each account. This process allows us to gauge the severity of the suspected leak." The utility reaches out to those who show up on the report by sending weekly postcards notifying them of a possible leak. It monitors the reports and notes which accounts have come off the list, assuming that they have responded to the utility's notice and fixed the leak.

#### **RESULT:**

The leak detection system provides critical information with only minimal operator involvement. Since the units were installed, operators monitor the system and analyze results at the utility office. **800/297-2728; www.aclara.com.**

### Leak detection system helps reduce nonrevenue water



1,500 sensors covering 400 miles of pipeline.

#### **Solution:**

The **AQS-SYS** fixed solution from **Aquarius Spectrum** provides up-to-date graphical information of history and statistics of every point of failure, finding underground leaks from the earliest stages of their development. This enables the utility to take steps and repair the leaks before significant amounts of water are lost. Each night, at the synchronized time, all sensors

take a noise sample and send the information to Aquarius Spectrum's cloud servers. All signals are processed and correlation algorithms for detection and alerts are issued.

#### **RESULT:**

By July 2015, the system had found 104 hidden leaks in Jerusalem, of which 73 were on the public network and 31 on private property. Fixing the leaks resulted in potential savings of over 264 million gallons of water. An additional 188 cases of non-leak faults were found, including faulty water meters, valves and other equipment under the responsibility of the water company. Of those, 116 were fixed and another 72 were determined to be emanating from external causes or not requiring repair. **www.aquarius-spectrum.com.**

### Internal leak detection system pinpoints waterline leak



#### **Problem:**

Vollers Excavating & Construction was working at an industrial property in New Jersey to verify the location of a leak on a 12-inch steel chilled waterline that was buried 10 feet in the ground. The piping network at the suspected leak location connected to a 90-degree offset straight down, then dropped approximately 20 feet vertically before connecting to

another 90-degree offset, allowing the chilled waterline to enter the building's mechanical room horizontally at a depth of over 30 feet below grade. The excavation cost to construct an engineer-designed safe hole with trench boxes and shoring was more than \$100,000. Vollers wanted to verify the leak was on the 20-foot vertical portion of the pipe, justifying replacement at a shallower depth in order to avoid increased excavation costs and more extreme working conditions.

#### **Solution:**

The company contracted NYLD Infrastructure, a.k.a. New York Leak Detection Inc., to assist in locating the leak. Acoustic listening and leak correlation methods could not be utilized for the process, as the leak was large enough that the pipe could not be fully pressurized. Vollers installed a 2-inch tap on the 12-inch steel waterline for NYLD to use the **Investigator** from **JD7** to do a live insertion for internal condition assessment and leak detection.

#### **RESULT:**

The Investigator helped pinpoint the leak nearly 12 feet below the 90-degree elbow on the 20-foot vertical portion of the line. NYLD also determined the internal condition of the pipe was good with no corrosion, pitting or tuberculation, and there was no reason for future concerns. **858/242-1640; www.jd7usa.com.**

### Contractor uses locator to battle underground 'spaghetti'

#### **Problem:**

The trend was clear to R.B. Hinkle Construction, based in Sterling, Virginia, on the outskirts of Washington, D.C. The underground infrastruc-



# The Rudy Tool



RT1



Tip Detail

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ture was getting so crowded that crews had taken to calling it spaghetti. Utilities were increasing their fees for line hits, and the company was paying more in those fees despite its heavy emphasis on safety.

### Solution:

They found **McLaughlin** and its **Verifier G2** utility locator. To use a G2, a crew member points the hand-held device at the ground and is given information on the receiver's LCD window to find the direction of an object line and its position. When the top of the line is found, the receiver beeps.

### RESULT:

A job site demo helped persuade the contractor that the G2 was the right choice. The crew deployed the G2 to confirm the marks and find potentially unmarked utilities. During the demo, an unmarked feeder cable was found that was directly in the excavation path. Using the G2, the crew followed the feeder cable to a pedestal where it terminated. If not for the G2, the crew "would have most likely hit this feeder cable and knocked out service to at least six townhomes," says Todd Gieseman, director of business development. **800/435-9661**; [www.mclaughlinunderground.com](http://www.mclaughlinunderground.com). ♦

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Inflow & Infiltration are destroying our underground infrastructure. The EPA reports 50% of the flow to the WWTP is clean groundwater adding to treatment cost, reducing capacity and the useful life of our assets. Condition assessment leads to a corrective plan of action and many proven trenchless alternatives. Most are structural repairs, but one is not—injection grouting. Grouting is complimentary, not competitive, to all trenchless technologies. A case in point: the City of Naperville, IL took a holistic approach to solving their infiltration problems to improve quality of life for their residents and rate-payers.

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**Luke Laggis**  
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 magazine



**Tony Conn**  
 Wastewater Collection &  
 Pumping Supervisor  
 City of Naperville



**John Manijak**  
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# Product Spotlight

Antenna enables utilities to reuse metal lids when communicating with RF meters

By Ed Wodalski

The through-the-lid antenna from Aclara enables utilities to reuse existing metal lids rather than replace them with RF-permeable lids when communicating with battery-powered STAR network modules in meter pits and vaults.

Engineered to operate through 1/4- to 2-inch-thick lids in temperatures from -40 degrees to 158 degrees F, the antenna is IP67 ingress protection rated, complies with the Americans with Disabilities Act and delivers road- and traffic-rated performance.

“The way the system works is the current MTU (meter transmission unit) has an internal antenna. This just brings that antenna out,” says David Rubin, product manager, Aclara. “It adds to your installation options. As a utility, you can put it against a wall, under a plastic lid or under a metal lid. It gives you different ways to get the signal out and read the meter.”

The antenna has a 5 1/2-inch mushroom cap that mounts to the top of the lid and a 3-inch stem that installs through an industry-standard-sized hole (1 7/8 inches) drilled in the pit lid. Secured in place by a threaded nut or optional brackets, the antenna connects to the transmission unit and meter through a 6-foot cable.

“It’s not intended to go in the middle of a well-traveled road,” Rubin

says. “If a semi goes over it now and again, it’s fine. But if semis are going over it all the time, that might be a problem.”

Other applications include commercial meter vaults with double steel doors.

“Obviously you can’t replace those with plastic,” he says. “People have gotten around this by drilling out the side and mounting the MTU in a special box or cutting a square hole in the top of the lid. With the antenna, it’s much simpler to keep the vault intact. Being able to drill a hole and install the antenna saves a lot of time and money.”

With no moving parts, the antenna has a 20-year life span and operates with single- or dual-port, standard- and extended-range meter transmission units.

“We’re confident of the technology in the network and the technology of reading meters,” Rubin says. “This just fills in the gap of how we get one talking to the other in specific places that might have been troublesome in the past. As far as the network is concerned, whether it’s an MTU with an internal antenna or an MTU with the external remote antenna, they operate the same.” 800/297-2728; [www.aclaratech.com](http://www.aclaratech.com).



KOMATSU WA380-8



PERMA-LINER TOP GUN



SENSIT HXG-2D

## Komatsu Tier 4 Final wheel loader

The WA380-8 wheel loader from Komatsu features a 6.69-liter, 191 hp Komatsu SAA6D107E-3, variable geometry turbocharged and after-cooled Tier 4 Final diesel engine that uses 6 percent less fuel than its interim predecessor. Smart-Loader logic software combines with a lockup torque converter that activates in second, third and fourth gears. Together, the system provides optimal engine torque for improved acceleration, hill climbing, higher top speed and fuel savings. 847/437-5800; [www.komatsuamerica.com](http://www.komatsuamerica.com).

## Perma-Liner inversion liner system

The Perma-Main Top Gun lining system from Perma-Liner Industries is designed for 6- to 24-inch-diameter pipelines. Materials are air inverted through existing manholes and steam cured in 1 1/2 hours. 866/336-2568; [www.perma-liner.com](http://www.perma-liner.com).

## SENSIT combustible-gas leak detector

The HXG-2d combustible-gas leak detector from SENSIT Technologies is ATEX certified when used with approved batteries. The gas detector features a low-power, semiconductor sensor for measuring combustible gases in the ppm and percent LEL range. The ppm readings autorange to percent LEL when the concentration





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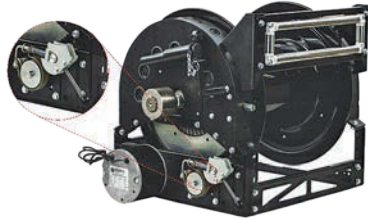
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exceeds 990 ppm (2 percent LEL methane). Optionally, readings can be set to a resolution of 0.1 percent LEL. **888/473-6748; [www.gasleaksensors.com](http://www.gasleaksensors.com).**

### Smith Flow Control coupling

The Bajolock coupling from Smith Flow Control automatically catches any dangerous residual pressure and safely discharges it away from the worker. When no potentially harmful pressure exists, the coupling can be operated normally with a twist. Designed for use in transfer systems for pressure up to 145 psi, the stainless steel coupling is manufactured according to the European Pressure Equipment Directive and CE approved. **859/578-2395; [www.smithflowcontrol.com](http://www.smithflowcontrol.com).**

### COXREELS three-way brake reel

The three-way, lever-actuated brake accessory for 1600 Series reels from COXREELS provides locked (full brake), drag (minimal brake) and free-spin (no brake) positioning during transport, unwinding or rewinding. **800/269-7335; [www.coxreels.com](http://www.coxreels.com).**

### Asahi/America double-wall piping system

The Poly-Flo co-extruded double containment piping system from Asahi/America is available in black PE for above- and belowground applications and euro gray PP-R for higher temperatures. Sizes include 1 by 1 1/2 inches, 2 by 3 inches, and 4 by 6 inches. The system is designed to operate at up to 150 psi at 68 degrees F and is suited for installations with space constraints, and where thermal expansion and contraction are present. **800/343-3618; [www.asahi-america.com](http://www.asahi-america.com).**

### Brentwood stormwater management structure

The StormTank Arch from Brentwood is designed for large-footprint, subsurface stormwater management projects. Typically installed under parking lots, parks and athletic fields, the Arch system features structural rib end panels and interlocking ends for easy installation. **610/374-5109; [www.brentwoodindustries.com](http://www.brentwoodindustries.com).**

### General Pump high-flow unloader valve

The YU3723 high-flow unloader valve from General Pump is designed to handle flows up to 37 gpm and pressures up to 2,300 psi. **888/474-5487; [www.generalpump.com](http://www.generalpump.com).**

### Gorman-Rupp self-cleaning solids management system

The Eradicator solids management system from the Gorman-Rupp Co. is designed for the Super T Series of self-priming centrifugal trash pumps. The system includes inspection cover, back cover with plate with obstruction-free flow path, self-cleaning wear plate and tooth designed to clear material from the eye of the impeller, including sanitary wipes, plastic bags, feathers, hair, sludge and other clog-prone material. Update kits are available for existing Super T Series installations. **419/755-1011; [www.grpumps.com](http://www.grpumps.com).**

### Exact Pipe plastic cutting, beveling saw

The PipeCut P400 cutting and beveling saw from Exact Pipe Tools simultaneously cuts and bevels plastic pipe. Pipe sizes range from 3.9 to 15.7 inches in diameter and up to 0.98 inches thick (beveling up to 0.86 inches). Weighing 13 pounds, the saw includes portable pipe supports, cut-bevel and TCT blades (up to 300 cuts per blade). **844/392-2800; [www.exacttools.com](http://www.exacttools.com).** ♦



## Enviro-Care relocates headquarters

Enviro-Care relocated its headquarters to 1570 St. Paul Ave., Gurnee, Illinois. The company, which supplies screening and solids/grit management equipment, had been based in Rockford for 20 years.

## Grundfos Pumps names managing director

Grundfos Pumps named Jonathan Hamp-Adams managing director for the company's commercial building systems unit. Based in Downers Grove, Illinois, he will be responsible for leading sales and production of the PACO brand.



**Jonathan Hamp-Adams**

## R.S. Technical Services names sales manager

R.S. Technical Services named James "Jed" Dorough northeast regional sales manager. He will be responsible for helping develop solutions for the CCTV needs of private companies and municipalities.



**James Dorough**

## Tank Connection names president

Tank Connection named Vince Horton president. The former vice president of sales replaces Bill Neighbors. Horton is a founding partner and

has served as an executive staff adviser. Tank Connection became an employee-owned company earlier this year. Neighbors will remain a member of the company's board of advisers.

## Spirax Sarco releases condensate recovery brochure

Spirax Sarco released a 19-page condensate recovery brochure that includes condensate mechanical fluid pumps, automatic pump traps, electric condensate pumps, pump packages and flash recovery vessels. The publication is available as a PDF at [www.spiraxsarco.com/global/us](http://www.spiraxsarco.com/global/us).

## Liberty Pumps forms employee stock ownership plan

Liberty Pumps, a family-owned company for 50 years, has implemented an employee stock ownership plan (ESOP). The ESOP will not change company operations and the leadership team will remain in place.

## Plastics Pipe Institute names directors

Plastics Pipe Institute named Patrick Collings of Lane Enterprises chairman of the board of directors at its annual membership meeting. He will serve a two-year term. Other new board members include David Fink, vice chair; Michael Pluimer, advisory council chair; and Peter Zut, treasurer.



**Patrick Collings, left, PPI chairman, and Tony Radoszewski, president.**

## Budget Attachments & Parts launches website

Budget Attachments & Parts launched a mobile-friendly website, [www.budgetap.com](http://www.budgetap.com). The site features industry information and specifications on attachments and parts for skid-steers, forklifts, loaders, telehandlers, tractors and backhoes.

## LMK trenchless clean-out system meets ASTM standard

The Vac-a-Tee trenchless clean-out system from LMK Technologies meets ASTM F3097-15 standard practice for installation of an outside sewer service clean-out using a small bore cleared by a vacuum excavator. The standard can be viewed at <http://www.astm.org/standards/f3097.htm>.

## Global Pump, Mersino launch used-equipment websites

Global Pump and Mersino, sales distributor for Global Pump, have launched two used-equipment websites. Availability, model, age, hours and cost of the equipment can be accessed at [www.globalpump.com](http://www.globalpump.com) and [www.mersino.com](http://www.mersino.com).

## Mr. Rooter names president

Mr. Rooter named Doyle James as president. He also serves as president of ProTradeNet, part of The Dwyer Group's vendor relations department. James succeeds Mary Kennedy Thompson, COO for The Dwyer Group. ♦



**Doyle James**



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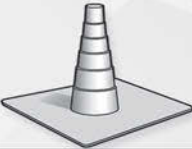
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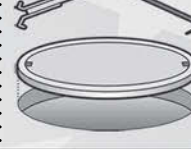
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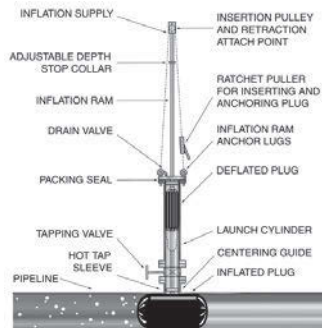
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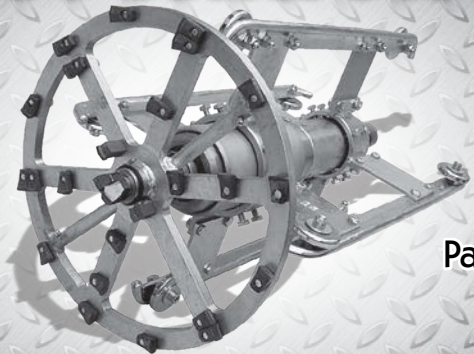


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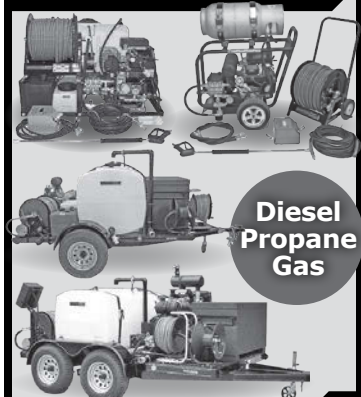
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## PEOPLE/AWARDS

The **Marion County Office of the County Engineer** earned the 2015 Excellence Award for a Stormwater Program from the Florida Stormwater Association. The award is presented to stormwater programs that demonstrate innovative accomplishment and outstanding commitment to best management practices that benefit the environment and local citizenry. The stormwater program has been an integral part of Marion County's water-quality protection efforts for more than a decade. Established in 2002, the program has implemented high-profile pollution-reduction projects that include the "Monster Pipe" on State Road 40 near Silver Springs and the 31st Street stormwater retrofit project, which helped and continues to remove tons of pollutants from Silver Springs and the Silver River.

The **Water Environment Federation** announced the winners of the 2015 StormTV Project competition. Launched in 2012, the project recognizes, highlights and promotes the work of stormwater professionals worldwide through videos that are submitted from nonprofit organizations, government entities, consulting firms and equipment manufacturers. Winners include:

- Public Education Category: Australian Car Wash Association — "Stormwater Pollution The Dirty Truth: Home Car Washing"
- Training Category: University of North Carolina Institute for the Environment and Town of Chapel Hill Stormwater Management Division — "Keep Restaurant Pollution and Profits From Going Down the Stormwater Drain"
- Commercial Category: Enginuity, LLC, makers of RainReserve — "Gilardis Segment"
- Programs and Projects Category: Atelier Dreiseitl, a Ramboll-Environ Company — "Bishan- Ang Mo Kio Park"

The **American Public Works Association** announced that seven public works professionals from North America recently earned their Certified Stormwater Managers credential. The APWA CSM certification is intended for water experts in both the public and private sectors who coordinate and implement stormwater management programs for city, county, state, provincial and federal agencies. These professionals assist in administering drainage, flood control and water-quality programs. Those receiving credentials include:

- Amy C. Murray, CSM (City of Goodlettsville, Goodlettsville, Tennessee)
- Bryan R. Aragon, CFM, CSM, PE (Los Alamos County, Los Alamos, New Mexico)
- David M. West, CFM, PE, CSM (Mohave County - Flood Control District,

Kingman, Arizona)

- James H. Barse, CSM (City of Alameda, Alameda, California)
- Juliana Archuleta, CSM (City of Brighton, Denver, Colorado)
- Michael Hunt, CSM (Metro Water Services, Nashville, Tennessee)
- Sheila Thomas-Ambat, CSM (City of Raleigh, Chapel Hill, North Carolina)

**James A. "Tony" Parrott**, the head of Cincinnati's drinking water, sewer and stormwater operations, was named the executive director of Louisville's Metropolitan Sewer District. Parrott is the first African-American executive director of the Metropolitan Sewer District in its 69-year history.

**Timothy Chatman**, stormwater compliance inspector for the Georgetown County Public Services Department, was named the 2015 Outstanding Public Works Employee by the South Carolina Chapter of the American Public Works Association. Chatman has been employed with Georgetown County for seven years.

## LEARNING OPPORTUNITIES

### American Society of Civil Engineers

The ASCE is offering:

- Nov. 5 – Managing the Design Process: Keeping on Schedule, Within Budget and Selecting the Right Resources, New Orleans
  - Nov. 12 – Pumping Systems Design for Civil Engineers, Scottsdale, Arizona
  - Nov. 19-20 – Financial Management for the Professional Engineer, Cincinnati
  - Jan. 7 – Pumping Systems Design for Civil Engineers, Charleston, South Carolina
  - Feb. 3 – Curve Number and Vegetative Techniques to Manage Stormwater Runoff Sustainably, online
  - Feb. 19 – The Importance of Adequate Construction Oversight for Stormwater BMPs and Stream Restoration: Examples of the Pitfalls of Limited Oversight Budget, online
  - Feb. 25 – Project Management, Lombard, Illinois
  - March 2 – Cold-Weather Stormwater BMPs That Work, online
  - March 10 – Pumping Systems Design for Civil Engineers, St. Louis
- Visit [www.asce.org](http://www.asce.org).

## CALENDAR

### Nov. 16-19

American Water Resources Association Annual Conference, Grand Hyatt Denver, Denver. Visit [www.awra.org](http://www.awra.org).

### April 25-27

American Water Resources Association Spring Conference, Sheraton Anchorage, Anchorage, Alaska. Visit [www.awra.org](http://www.awra.org).

### July 17-20

American Society of Agricultural and Biological Engineers 2016 Annual International Meeting, Orlando, Florida. Visit [www.asabe.org](http://www.asabe.org).

### Aug. 22-25

StormCon, Indiana Convention Center, Indianapolis, Indiana. Visit [www.stormcon.com](http://www.stormcon.com).

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Urbano knows everything about a Vac-Con truck, because he's been working on them – quietly – for 14 years. Urbano lives out “more power to you” every day. It's not just our tagline, it's in everything we do: our technology, our culture, and our leadership. Yes, our trucks are engineered to be powerful, but they're also built by smart people who keep the end-users in mind. They give you a machine that gets the job done. **GO ON-LINE TO LEARN MORE.**

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