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February 2016

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# A STERLING APPROACH TO STORMWATER CONTROL

Tallahassee has earned high honors  
for its innovative and comprehensive  
stormwater management program

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Jodie Cahoon  
City of Tallahassee Stormwater Manager  
Tallahassee, Florida



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City of Tallahassee Stormwater Manager Jodie Cahoon at the Upper Lake Lafayette Nutrient Reduction Facility in Tallahassee, Florida. (Photography by Keyhole Photo/Jeff and Meggan Haller)



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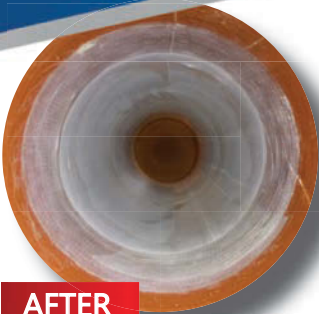
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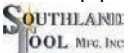






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# FINDING A BETTER WAY

The WWETT Show celebrates innovation, excellence and the evolution of the water and wastewater industry



## FROM THE EDITOR

Luke Laggis

Welcome to the 2016 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show issue of *Municipal Sewer & Water*. I hope you're gearing up for Indy and are excited to take in everything the show has to offer.

We've gone back to our Wednesday-through-Saturday schedule to make it easier for you to attend, and we've added new components to make the show even better. It's the biggest show we've ever put on, and I think it's going to be the best you've ever attended.

I can remember how impressed I was with the size and scope of the show floor on my first trip to Indy, but after five shows, I realize it's not the trucks and equipment that make it so impressive. It's the people. I'm looking forward to talking to as many of you as possible, getting your feedback, listening to the issues you're facing, and hearing your stories. Of

course, I'm excited to check out all the new tools, trucks and equipment, too, but it's really your stories I'm most interested in.

This is an evolving industry with a high level of technology and innovation, yet sometimes it's still the smallest utilities, trying to do more with less, that figure out how to build a better mousetrap.

That's part of what makes the WWETT Show such a great experience — technicians, operators and engineers from Los Angeles to Mishawaka, Indiana, all seeking better ways to serve their communities. And that's mirrored by the diversity of manufacturers, from large companies offering state-of-the-art inspection systems, to the startups providing innovative ways to address specific issues you face every day. It's the positive, proactive approach we celebrate in *MSW*, and it's on display all week at the show.

Whether you're in the classroom or kicking the tires on a half-million-dollar hydroexcavator, you'll have no problem finding inspiration. So take advantage, because the insight you gain could help you solve a simple problem or make sweeping changes in your system.

You'll have plenty of opportunities to improve your utility while you're in Indy. You'll also have plenty of opportunities to relax and enjoy yourself. Make sure all of the following are on your itinerary:

**Education Day.** You don't have to spend all day in the classroom, but be sure to pick out at least a couple classes that address questions, areas of interest or new opportunities you've been eyeing. The level of instruction is excellent, and the knowledge gained will serve you year-round.

**Kickoff Party.** Get on the dance floor! No, it's not that kind of party, but there will be free food and drinks. And you'll be able to hang out and chat with some of the smartest people in the industry. That's a fun (and productive) way to cap off Education Day.

**Walking the floor.** OK, this one is obvious, but make sure you see everything on the show floor. You don't know where you might find inspiration or solutions to problems nagging your system, and there's some pretty cool stuff to see.

**Sewer History Exhibit.** Get a look at where it all began. NASSCO and the Arizona Water Association brought their Sewer History Exhibit to the show for the first time last year, and it's back again. It's an impressive display of early ingenuity and a great look at how far the industry has come.

**Industry Appreciation Party.** Jerrod Niemann is playing. And beer only costs a quarter. Enough said. Don't miss out.

It's not easy to boil the whole week down to a few items on your itinerary, and really, why would you want to? There's so much more to see and do. Take it all in, and enjoy the show.

Welcome to Indy! ♦

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



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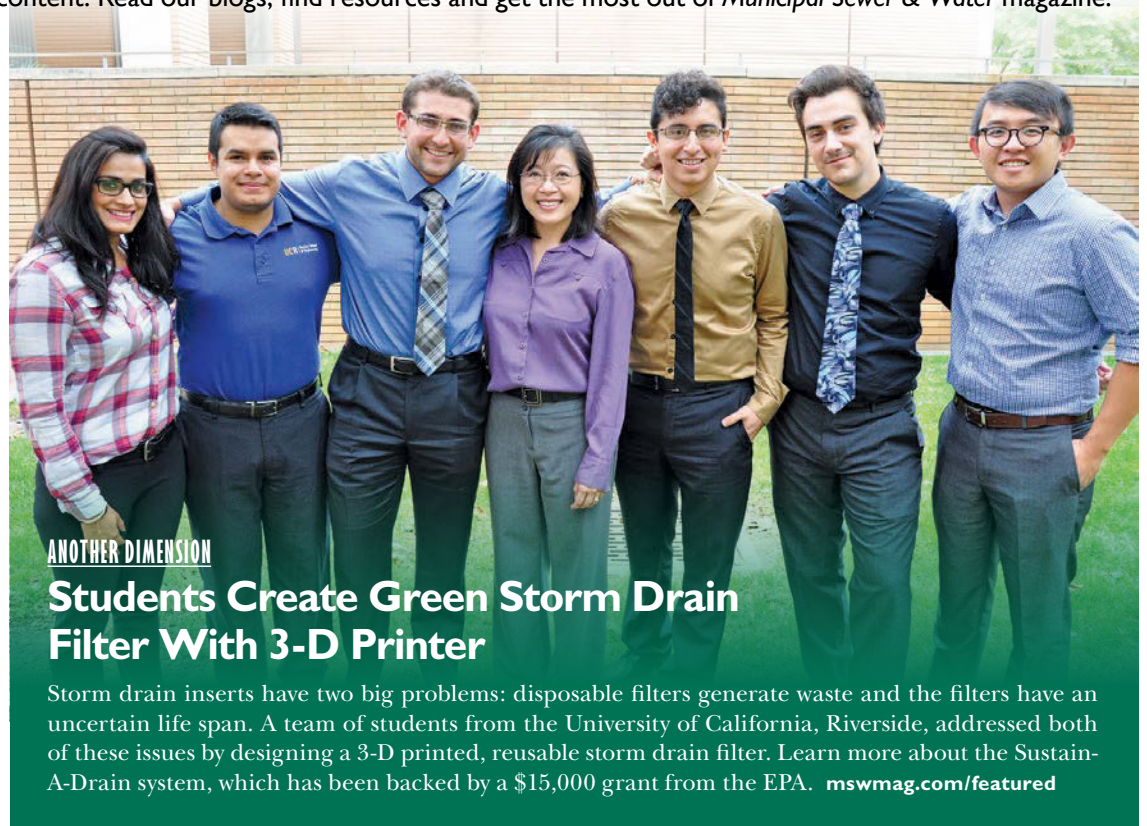
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## OVERHEARD ONLINE

“If water utilities want people to remember what they have to say it’s worth noting that, in general, when it comes to remembering any message, shorter is better — Trumpify your message.”

— *What Water Utilities Can Learn From the Donald Trump Phenomenon*  
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## ANOTHER DIMENSION

### Students Create Green Storm Drain Filter With 3-D Printer

Storm drain inserts have two big problems: disposable filters generate waste and the filters have an uncertain life span. A team of students from the University of California, Riverside, addressed both of these issues by designing a 3-D printed, reusable storm drain filter. Learn more about the Sustain-A-Drain system, which has been backed by a \$15,000 grant from the EPA. [mswmag.com/featured](http://mswmag.com/featured)



## ABOVE & BEYOND

### Video: Class Ring Returned After 54 Years

It had been over a half century since a Poplar, Missouri, man last saw his 1961 class ring. Thanks to some tremendous luck — and the diligence of water utility workers Wade Stoner and Marlin Barker, who went out of their way to find its rightful owner — the 10-karat gold ring is finally back where it belongs. Hear how Bobby Rice lost his ring and the remarkable story of how he ultimately got it back. [mswmag.com/featured](http://mswmag.com/featured)

## NOZZLE KNOWLEDGE

### Understanding Nozzles and How They Work

Having the right nozzles is a key step to cleaning sewer lines efficiently. But just because a nozzle cleans well in one situation, doesn’t mean it will clean well in another. Clear lines faster and take the guesswork

out of high-pressure waterjetting by understanding the capabilities — and limitations — of the nozzle types available. [mswmag.com/featured](http://mswmag.com/featured)



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Laura Webb Smith, public education coordinator with the Stormwater and GIS Services Division of the Durham Public Works Department, checks the water clarity of South Ellerbe Creek in Durham, North Carolina. (Photography by Al Drago)



# SMALL PROJECTS BRING BIG SUCCESS

Durham stormwater utility enlists the general public in an award-winning campaign to tackle small projects on private property

By Erik Gunn

**D**urham, North Carolina, has no small challenge when it comes to managing the community's stormwater.

The city has to do more than just make sure the rain gets out of the way. It's also charged with keeping the runoff from polluting local drinking water supplies — the same bodies of water to which the stormwater returns.

Durham has taken a two-part approach to its stormwater battles. One part consists of an array of big projects and some experimental strategies that the city and its stormwater utility are using to help ease the flow of runoff. The other part consists of enlisting community residents to take on small projects in their own backyards — or front or side yards for that matter.

By encouraging, educating and supporting property owners in the simple, home-based proj-

ects, Durham's stormwater utility can more effectively focus on its own bigger projects, says Laura Webb Smith, public education coordinator for Stormwater and GIS Services in Durham's Public Works Department.

Regulators have taken notice. In June 2015, the U.S. Environmental Protection Agency's Region 4, which includes the Tarheel State, gave Durham its regional 2015 EPA Rain Catcher Award in the municipal category. The award honors excellence in the implementation of stormwater green infrastructure practices.

### 'Most regulated city'

Durham, with a population of about 250,000 people, has operated its own stormwater utility since the early 1990s, although its stormwater management infrastructure is a lot older than that.

Including both privately and publicly managed parts, the stormwater collection system consists of 923 miles of pipe. About half of that, 48 percent, is the responsibility of private property owners. Another 17 percent is associated with state roads in the city and is maintained by the North Carolina Department of Transportation.

But 35 percent of the total — about 323 miles — is within the city's right-of-way or on city property and falls directly under the city's control. A city stormwater maintenance group takes care of the upkeep, while a capital improvements group is in charge of larger new design and construction projects.

Durham's average yearly rainfall, about 44 inches, is below the national average, but stormwater is still a major problem for the city.

The city's location is one major reason for *(continued)*



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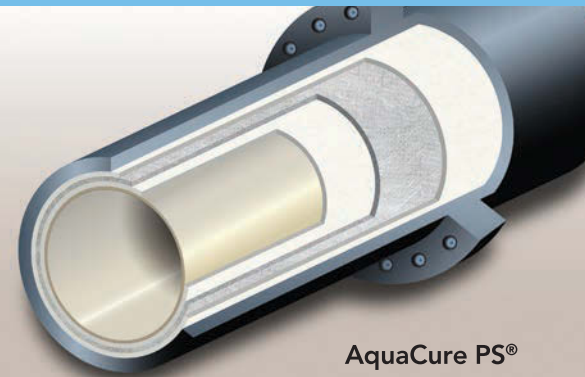


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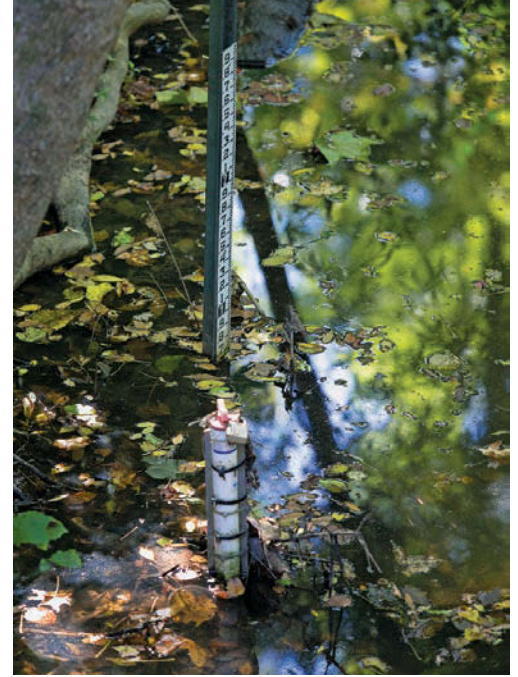
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Civil engineer Sandi Wilbur checks an output tube in one of 40 rain gardens that were installed to catch rainwater runoff and prevent flooding. The tube runs from the base of the house where rainwater is caught to the rain garden at the bottom of the hill. Right: A water level indicator shows that the creek bed is only 7 inches deep near the South Ellerbe Creek water monitoring station. The Rain Catchers program is aimed at trapping some of the water in yards instead of flowing straight to the creek.

**“We are the most regulated community when it comes to stormwater in the State of North Carolina, and that’s just because of where we sit geographically.”**

– Laura Webb Smith

the concern. “We are the most regulated community when it comes to stormwater in the State of North Carolina, and that’s just because of where we sit geographically,” Webb Smith says.

Essentially, Durham is atop a ridge between two major bodies of water that supply drinking water not just to the city, but to surrounding communities as well. Southwest of the city, the water flows to Jordan Lake, which feeds the Cape Fear River and into the Atlantic Ocean. Water from the northeastern part of the city goes first to Falls Lake, which feeds the Neuse River, the Albemarle-Pamlico Sound, and the ocean.

**From stormwater to drinking water**

“We’re in these two major watersheds that happen to be the drinking water for one of the largest metro areas of the state,” Webb Smith says, with Jordan Lake supplying Durham’s drinking water while the other bodies supply other communities.

Under the federal Clean Water Act, Durham has been classified as a phase one city for implementing the National Pollution Discharge Elimination System requirements to clean up stormwater pollution.

State regulations for runoff have gotten tighter in the last half-dozen years, although Durham and other cities affected have known they were coming. That’s intensified the urgency of the task, and the city has been trying to tackle the problem using any approach it can.

Some big projects — including some that experiment with new technology and bring market forces to bear on the problem, are part of its arsenal, but so too is the work Durham has done to encourage individual property owners to install small stormwater abatement projects.

**Public pilot**

That ongoing program began with a pilot project — also called Rain Catchers — that ran from 2012-14. A total of 880 households in the South Ellerbe Creek watershed were contacted, and 156 properties were selected for rain gardens, rain barrels or cisterns, and planting trees chosen for their particular stormwater abatement suitability. Downspouts were also disconnected so that water would be dispersed rather than flowing straight into the stormwater collection system.

“Basically what I tell people is, what you want to do with the stormwater in your yard is slow it down, spread it out, and soak it in,” Webb Smith says.

Those projects were completed last year. Now the utility is studying the results and assessing both the quantity and quality of the stormwater coming from the properties that took part. “We want to see a reduced level of water going to the creek during and immediately after the storm,” says Webb Smith, while the expectation is that slowing down the water will also cleanse it of pollutants, improving its quality.

The utility assembled a year’s worth of stormwater data before implementing the Rain Catchers program. As the study measures outcomes on the Rain Catchers properties, it will also compare those with a separate nearby watershed that did not use the 250 different abatement practices that were part of the Rain Catchers project.

Meanwhile, the utility continues to work with property owners to encourage more of the same improvements, even though the Rain Catchers

pilot project is now finished.

**Effectiveness with simplicity**

A backyard rain garden doesn’t have to be elaborate or complex to be effective. “It can be as simple as digging a hole and putting in some plants,” says Sandi Wilbur, Durham’s engineer for special projects watershed planning and implementation.

The garden is sized to capture the runoff from the area that drains to it in a typical rainfall. Soils in the region are rich in clay — “not the best for soaking in water,” Wilbur says — and must be replaced with much sandier materials mixed

(continued)



**PROFILE:**  
**Durham (North Carolina)**  
**Public Works Department**

**POPULATION SERVED:**  
 250,000 people

**SERVICE AREA:**  
 City of Durham, North Carolina (110,000 square miles)

**NUMBER OF EMPLOYEES:**  
 94

**INFRASTRUCTURE:**  
 923 miles of stormwater collection lines (323 under direct city control)

**ANNUAL OPERATING BUDGET:**  
 \$15.35 million

**WEBSITE:**  
[durhamnc.gov/692/Stormwater-GIS-Services](http://durhamnc.gov/692/Stormwater-GIS-Services)



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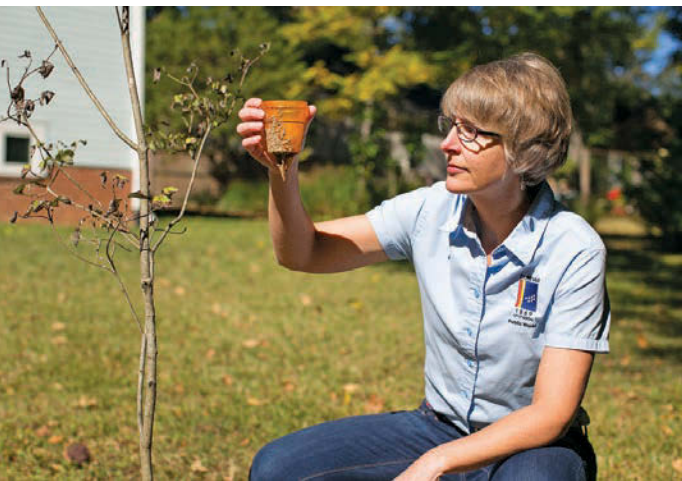
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**Public Education Coordinator Laura Webb Smith (left) and civil engineer Sandi Wilbur inspect a stormwater drain for obstructions. Below: Webb Smith inspects a rain gauge at one of the 108 trees the city planted to help soak up excess rainwater.**



with loam through which the runoff can drain. “You’re letting the water go through that before it returns to the native soils.”

In addition to the rain garden projects, property owners are also encouraged to install larger rain barrels — 200-gallon capacity units nearly four times the size of the standard 60-gallon barrels. The smaller size “just fills up too quickly,” says Webb Smith, despite the below-average annual rainfall.

“This is a stormwater management project, not a water conservation project,” says Webb Smith. “This is not about just saving water and reusing it.” With the jumbo-size rain barrels, about one-third of the water collected is slowly drained out after each rain; property owners use what’s

left to water their plants, and the rest is typically released between storms.

Alongside those low-tech and small-footprint individual projects, Durham continues to work on other much larger projects to combat runoff.

### **Community collaboration**

For some of those efforts, the utility works with local watershed groups and soil and water conservation districts.

Big or small, a primary goal of the work is to reduce nitrogen and phosphorus levels in the bodies of water to which the city’s stormwater ultimately returns. Its ridgetop location makes Durham’s runoff the assumed source of nutrient pollution in Jordan and Falls lakes, Wilbur notes, so it’s up to Durham to reduce those levels and keep them in check.

Estuaries that are part of the network of water bodies through which the stormwater returns “are especially challenging,” says Webb Smith. “They hold the pollution in. Ever since the 1990s we’ve been under a nutrient rule for the Neuse River estuary.”

Both new and existing development must comply with standards to reduce nutrients carried by stormwater. “You have to reduce nitrogen and phosphorus from wherever you can get it,” Wilbur observes.

In compliance with a statewide nutrient strategy, Durham enacted a law setting limits on how much nitrogen and phosphorus new development sites could emit. Levels are calculated by measuring effluent concentration as well as volume reduction by measures installed to control stormwater,

such as wet ponds and bioretention facilities.

“Stormwater control measures must be built to standards found in the North Carolina BMP Manual,” Wilbur points out. In addition, the city requires annual checks that stormwater control measures are working properly.

“For existing development, there are several stages of reductions required,” she continues. “The first stage requires the city to reduce nitrogen and phosphorus that was added from development that has occurred since 2006. The city must then reduce the pounds per year of nitrogen and phosphorus through nutrient-reducing measures.” The state requires monitoring Falls Lake itself to see if the target levels have been met.

If levels exceed the maximum standard, then additional steps are required.

“The city is working collaboratively with a group of governments and others who are also affected by the rules to provide additional data, tools and information to help inform the adaptive rules for later stages,” Wilbur says. “The city has been monitoring local streams for over 15 years and is working on a project to monitor effluent concentrations of industrial stormwater control measures in addition to our regular monitoring and the monitoring being done for the Rain Catchers project.”

The city tracks additional sources of pollution in streams besides nutrients, and has a program to identify illicit connections to the stormwater system, such as bathroom plumbing being piped directly to a stream, with the power to enforce compliance with the regulations when such violations crop up.

### **Beyond rule enforcement**

Just enforcing the rules for developers is far from enough, though, so Durham is marshaling other tactics.

“We’re looking for cost-effective measures to reduce nitrogen and phosphorus,” says Wilbur. “In addition to some of these small-scale projects, we have some larger regional projects.”

## **NUTRIENT BANKS**

In one of the more unusual ways of reducing nitrogen and phosphorus pollution that can cause overgrowths of algae in area lakes, the Durham (North Carolina) Stormwater Utility is looking at employing market forces and something called “nutrient banks.”

So-called “nutrient bankers” are typically contractors or others involved in projects that have an impact on waterways and wetlands. They develop projects to mitigate nitrogen and phosphorus runoff from the site — for instance, planting trees and other vegetation in order to create a buffer to runoff in the area of a stream.

Qualified projects that reduce the flow of nitrogen and phosphorus back to

the original water sources generate credits for nutrient reduction, explains Sandi Wilbur, Durham’s engineer for special projects watershed planning and implementation. The “nutrient banker” can then sell those credits to other parties — such as the stormwater utility — which can use them to offset their total production of nitrogen and phosphorus in their runoff.

In the 1980s and ’90s, a similar approach was successful in reducing pollution that caused acid rain in the southeastern U.S. and in Europe, notes Laura Webb Smith, public education coordinator for Stormwater and GIS Services in Durham’s Public Works Department.

Durham has a request-for-bid out to seek nutrient bankers who will build such projects in the city that would generate nutrient credits that Durham could then purchase to offset its own nutrient output.



Green area restoration is one big priority, turning once-developed but now unused land back into green space that can absorb runoff more easily. Of various such projects underway, the fastest moving are those on city-owned land, where the hurdles tend to be lower, she notes.

One of the biggest such projects involves private property, which the utility is negotiating to acquire to convert to a wetland. Once that is complete, the land would collect and help filter runoff from a large part of downtown Durham.

Another tactic is technological innovation. Durham is exploring the use of an algal turf scrubber for lakes that are already high in nutrients and therefore becoming populated with algae as a consequence. Algal turf scrubbing entails drawing water from the lake, passing it through a flow way where the water leaves algae behind in the form of a matted mass that's something like dryer lint in its texture and consistency.

"We're trying a lot of different types of things," Wilbur says. "At this point we're trying to figure out what are the best methods."

#### **Watershed wisdom**

Along the way, utility personnel are studying much more closely the many watersheds that drain into each other and ultimately into the lakes. "We're actively trying to find locations to implement these practices," Wilbur says. "We do some water-quality modeling and try different kinds of scenarios to determine what might be causing the pollution."

There are 10 major and several smaller watersheds in the community. So far, Durham has examined five watersheds and is working its way through more. With each one it assesses the ease or difficulty of completing the project against the likely degree of benefit.

For the Falls Lake watershed, the city must reduce nutrient levels in the water to what they were in 2006. (The Jordan watershed requires reductions to 2001 levels.) Considering how much new development there has been since then, that raises the bar considerably, Wilbur and Webb Smith point out.

#### **Stream regeneration**

Still another approach has been regenerative stream conveyance, a technique that Durham has been exploring in collaboration with North Carolina State University.

A drainage channel near the city's public works operations center is a test site for that sort of work. Water flows have eroded the stream bed and damaged vegetation in the area, leaving steep banks and reducing the ability of the area to absorb nutrients, which instead get sent downstream where they aren't wanted.

To slow down the stormwater and protect the stream banks, the utility is putting rocks in the stream bed, planting native vegetation, and scattering small pools filled with mulch and sand in

**"The field of stormwater treatment is young and evolving. Stormwater is considered a nonpoint source, so as we evolve, more sources are being identified and innovative tools are being used to help pinpoint and reduce pollution in stormwater."**

– Laura Webb Smith

the area to further soak up water in hopes of reducing both nutrient pollution and erosion. If the results are satisfactory, the technique will be employed elsewhere in the area.

Even as Durham makes progress on its stormwater control, the bar is being raised ever higher.

"The field of stormwater treatment is young and evolving," Webb Smith says. "Stormwater is considered a nonpoint source, so as we evolve, more sources are being identified and innovative tools are being used to help pinpoint and reduce pollution in stormwater." ♦

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# TIME TO UNWIND

Country artist Jerrod Niemann ready to give WWETT Show attendees a night of music and fun

By *Cory Dellenbach*

**I**t doesn't matter if you're a country music fan. Jerrod Niemann is going to draw you in when he hits the Industry Appreciation Party stage Feb. 19.

"You have to be aware of what you're around," says Niemann, country music star and entertainer for the party. "If you're doing your own show or people are there just because of you it's one thing. If you are part of a party that has already existed for many years, we try to be a chameleon of sorts. We'll do our own songs, but we'll also throw in a couple different ones, too, from rock and blues and everything."

No matter what he sings, Niemann promises a fun time for everyone at the Indiana Convention Center's Sagamore Ballroom.

"There's just something to be said about being around people who are pretty much just like you — hardworking, small-town Americans," Niemann says. "For me, I love being out there and hanging out with everybody."

## **In his blood**

Country music has always been in Niemann's blood, and he thanks his mother for that: "I was doomed from the beginning hearing country music from the womb. My parents ran a bar when my mom was pregnant with me, and I think hearing all those country songs on the jukebox got me going."

From an early age, Niemann was influenced by country acts such as Lefty Frizzell, Keith Whitley and George Strait. After graduating from high school, he attended South Plains College in Levelland, Texas, pursuing an

Associate of Arts degree. He began his professional career by singing and playing acoustic guitar in Texas clubs and bars.

"I did that for about a year, just my guitar and me," he says. "Then I moved to Nashville and started working out there. Music is one of those things where it's such an amazing thing to be a part of that once you've been bitten by the bug, there is no way out of it. It's just who you are."

In 2010, Niemann signed with record label Arista Nashville and released his debut single, "Lover, Lover." It became his first Top 40 single on the country music charts, and in August 2010 it hit No. 1.

## **THE BASICS**

### **Industry Appreciation Party**

**WHEN:**  
Friday, Feb. 19

**WHERE:**  
Sagamore Ballroom, Indiana Convention Center, Indianapolis

**TIME:**  
5 p.m. doors open; 7 p.m. Jerrod Niemann



Since then, Niemann has released four albums — *Judge Jerrod & the Hung Jury*; *Free the Music*; *Yellow Brick Road*; and *High Noon*. In 2013, his single “Drink to That All Night” hit No. 4 on the U.S. country charts and No. 1 on U.S. country airplay charts.

“I got my foot in the door writing songs in Nashville, and it’s always fun being able to write your own material,” Niemann says. “Every once in a while you find a song you wish you had written.”

### New music

One of those songs is “Blue Bandana,” his newest single, released in July. The song will be a part of his new album set for release later this year.

“When I heard the song it just took me to so many cool places and really took me to a lot of cool faces, too,” Niemann says. The song tells the story of a fan attending concerts wearing the same blue bandana and the singer

noticing it each time. “Just traveling this country you see a lot of people who are kind enough to pack up in their cars and do a road trip spending their hard-earned money to see us. I’ve never really done a song that is a thank-you to those folks out there, but this song does that.”

The new album will combine music he’s done before — a country/rock mix — and the more traditional country sound. “It’s a wide array of music,” Niemann says.

He’ll perform some of the new songs from that album at the WWETT Show and hopes everyone can relax and get their minds off work and anything else going on in their lives.

“The real world can be quite a hard place at times for people, and if we can be the guys to get that off their minds for at least 90 minutes, then we’ve done our jobs,” Niemann says. “I just always try to keep a thread of laughter and craziness at our shows if we can.” ♦

## THREE NIGHTS OF WWETT SHOW FUN

By Luke Laggis

You come to Indy for the tools and equipment, the people and excitement. It’s the one time of the year when the whole industry comes together. So let’s have a party.

COLE Publishing celebrates the occasion every year with the Industry Appreciation Party. It’s a chance for everyone to relax and enjoy themselves. This year, the WWETT Show Kickoff Party will give you two nights to enjoy leading up to the Industry Appreciation Party.

It all starts Wednesday night. After the final bell rings on Education Day, you can head over to Lucas Oil Stadium, connected to the Indiana Convention Center, for a cold beverage and complimentary hors d’oeuvres while you network with manufacturers and peers. The event will be held Feb. 17-18 from 5 to 8 p.m.

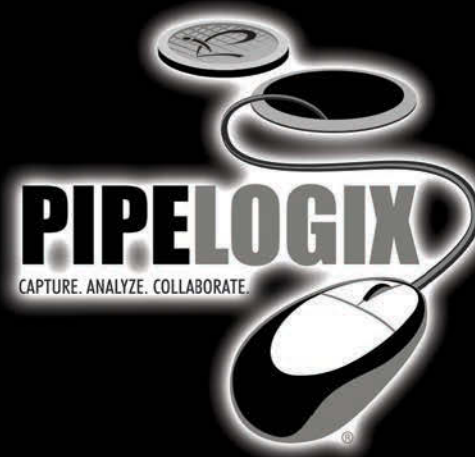
Exhibitors have been invited to co-host the event along with COLE Publishing, and the COLE Pub truck will return to serve as the central bar. Attendees and exhibitors can kick back, relax, share stories or solve problems with industry peers.

“We are very excited to see how creative the co-hosts decide to be,” says Brad Bisnette, the show’s coordinator. “All will be providing a good time for sure.”

On Friday night, the focus will shift from Lucas Oil to the Sagamore Ballroom in the Indiana Convention Center for the Industry Appreciation Party. Country music star Jerrod Niemann will perform an up-close and personal concert for WWETT attendees. Beers are a quarter and the show is free, so you really can’t go wrong.

Visit [www.wwettshow.com](http://www.wwettshow.com) for complete details on the show. The Kickoff and Industry Appreciation parties are free for all registered attendees.

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# ELIMINATING OVERFLOWS IN THE CIRCLE CITY



DigIndy project aims to eliminate combined sewer overflows by building a series of tunnels under the city

*By Cory Dellenbach*





The first leg of the \$1.9 billion DigIndy project — boring the 7 1/2-mile Deep Rock Connector Tunnel (right) and the offshoot Eagle Creek Deep Tunnel — was completed in October. (Photos courtesy of Citizens Energy Group)

**D**eep under Indianapolis, a massive machine is slowly chewing its way through the bedrock the city stands on. In its wake, a new tunnel system will provide relief from combined sewer overflows that have plagued the city.

“DigIndy is a very large project that is going to include taking offline a number of CSOs that are currently located within the central part of Indianapolis,” says Tim Shutters, construction supervisor for Citizens Energy Group.

Citizens, a utility service company providing natural gas, thermal energy, and water and wastewater services to about 800,000 customers in central Indiana, began the project in 2012 and expects to complete it by 2025.

“In 2011, Citizens acquired all of the water and wastewater infrastructure from Indianapolis,” says Mike Miller, manager of construction. “That included the city’s commitment to build the tunnel system to conform to the consent decree established by the U.S. EPA.”

### The need

When Indianapolis was being built up, the most sophisticated way to handle stormwater removal was via the sanitary sewer system.

“Under dry, slow conditions the sanitary flows run to the wastewater treatment plant and everything is fine and works as it should,” says Shutters. “When rain events come along, however, the system becomes overwhelmed. Overflows were created that exit into the local bodies of water.”

Local officials knew something had to be done to stem the flow of pollution. In 2006, the EPA and the U.S. Department of Justice reached a con-

sent agreement with the city to eliminate 97 percent of CSOs by 2025. “We have about 138 CSOs on the whole system, and this project is going to catch about 100 to 110 of those,” Miller says.

### The project

The \$1.9 billion project includes using boring machines to create 28 miles of 18-foot-diameter tunnels 250 feet below the city. The first leg of the dig — mining of the 7 1/2-mile Deep Rock Connector Tunnel and the offshoot Eagle Creek Deep Tunnel — was completed in October. The joint venture of contractors Shea-Kiewit took the lead on the project.

“We are currently lining that portion right now with a 1-foot-thick liner to keep groundwater out,” Miller says. “It’s basically a set of framework that is 210 feet long and collapses in on itself and can be moved from the finished port to an open section that’s been mined. Then we pump concrete from the surface into the framework and it leaves the 1-foot liner after we remove the framework.”

That portion of the project should be finished around the end of 2017.

“Originally, the Eagle Creek section was going to be open-cut, but it was going to be very cumbersome and it was going to be deep and near a levee system. We were able to come to an agreement with our contractor and went ahead with tunneling that portion.”

Tunneling also added more storage capacity on the Eagle Creek line; the open-cut process would have used a smaller-diameter pipe.

The completion of the Deep Rock and Eagle Creek tunnels leaves just four remaining segments.

The next two segments — the White River Tunnel and the Lower Pogues Run Tunnel — are in the procurement process.

“We have asked a few contractors for pricing,” says Shutters. “Shea-Kiewit has done a great job, but we felt it was necessary to allow some other people to come in and competitively provide pricing so we could get the best value.”

The project is designed so that when each segment is completed, it can go online immediately while work continues on the next. “There will be a big bulkhead that we put between the Deep Rock and the next tunnel so everything south can go online,” Miller says.

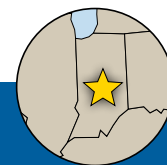
### The next phase

The White River and Lower Pogues segments are set to begin early this year. The Lower Pogues is expected to affect downtown the most; it will go past Lucas Oil Stadium.

“Most people won’t even notice the deep underground work,” Miller says. “However, there are three drop shafts that we have to construct from the ground surface down in that portion of the project. That is going to be pretty impactful on downtown for the better part of a year.”

Overall, there will be 33 drop shaft sites along the project route. While larger contractors will handle the tunneling portion of DigIndy, local contractors will handle the other parts of the project — installing drop shafts and other street work.

“We’re on the backs of ratepayers, and they want to see the money staying local,” Miller says. “The big tunneling contractors are employing local laborers and subcontractors, and the shallow work stuff will be sent out to local contractors.”



## PROJECT DETAILS: DigIndy

**UTILITY:**  
Citizens Energy Group

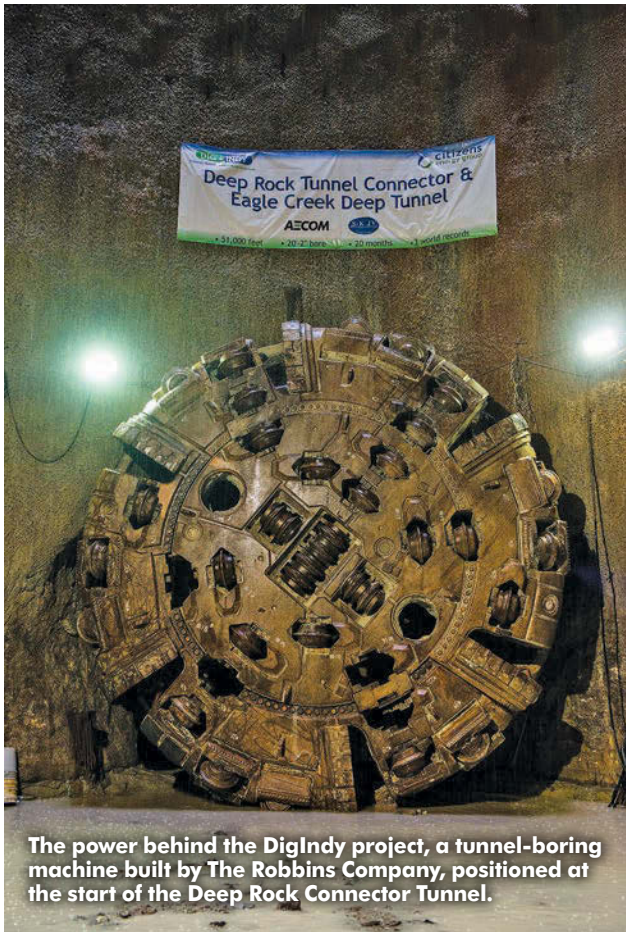
**LOCATION:**  
Indianapolis, Indiana

**START:**  
2012

**PROJECTED END:**  
2025

**WHAT IT IS:**  
A series of 18-foot-diameter tunnels 250 feet belowground in Indianapolis designed to minimize combined sewer overflows





The power behind the DigIndy project, a tunnel-boring machine built by The Robbins Company, positioned at the start of the Deep Rock Connector Tunnel.

### Setting records

The project earned national recognition in 2013 when Shea-Kiewit bored 410 feet in 24 hours, setting a world record for tunnel-boring machines of similar size. “We’ve also broken records for the most production in a week and a month,” Miller says. “Because of that, we’re pretty far ahead of schedule.”

The tunnel-boring machine was manufactured by The Robbins Company in the late 1970s and spent most of its life in New York working on water and subway tunnels.

“It most recently came to us via the Second Avenue Subway Project in New York,” Miller says. “Shea-Kiewit rehabilitated the machine themselves with input from Robbins, and then Robbins manufactured a new cutter head specifically for this project.”

### Minor hiccups

All projects have their little hiccups, and DigIndy is no exception. There have been little pauses along the way, including finding unantic-

ipated groundwater during the Deep Rock drilling segment.

“The contractor was very good about working with us on a solution to mitigate the impact of the water during construction,” Miller says. “It wasn’t detrimental to the project. It was just a little more than anticipated in a certain area.”

Crews also had to deal with the alignment of Deep Rock, which includes many turns. Contractors used a conveyor belt system to remove debris from the tunnel.

“A conveyor belt only really likes being in a straight line,” Shutters says. “Every time we put a curve into the tunnel alignment, our contractor had to overcome some obstacles to make that rubber band want to turn.”

Having to deal with those alignment issues led Citizens Energy to look at the rest of the project and modify alignments in the next phase to minimize changes in direction.

“For the most part we have been very lucky with the project,” Miller says. ♦

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# A STERLING APPROACH TO STORMWATER CONTROL

Tallahassee has earned high honors for its innovative and comprehensive stormwater management program

By *Scottie Dayton*

Racking up state and national awards is almost second nature for the City of Tallahassee (Florida) Stormwater Management Group. The accolades recognize one of the state's most robust stormwater utilities that is often responsible for innovative firsts, driven by a \$9.2 million capital improvement program.

The climb to the top of that hill was steep and winding. The group formed in 1987 as a result of the losing hand dealt by topography and weather. Tallahassee ranks ninth-rainiest in the nation and second-rainiest in the state. Rolling hills, clay soils, and elevation changes of up to 200 feet exacerbate runoff. Some neighborhoods built before stormwater and land development regulations were enacted are in flood-prone areas.

"Those factors created huge challenges, and we needed ways to address them," says Jodie Cahoon, P.E., and manager of Stormwater Management. "We created the first stormwater utility in the state and pioneered the equivalent residential unit concept."

Today, 86,000 residential and 8,500 nonresidential customers pay a monthly \$7.95/ERU stormwater fee.

From the onset, the department focused much of its energy and money on alleviating flooding. To date, the city has spent in excess of \$125 million on 150 city-wide stormwater projects that have protected more than 750 properties. Multiple regional stormwater facilities have changed the city's landscape and become community amenities.

Stormwater and erosion control projects also garnered a long list of awards, including four from the Big Bend Branch of the American Public Works Association since 2010. The 2014 Excellence Award from the Florida Stormwater Association recognized the multifaceted stormwater program's successes over 25 years.

In 2015, the Underground Utilities Department, which includes SMG, won the Governor's Sterling Award for its organizational performance and management excellence.

"The Sterling Award is Florida's highest honor for an entity," says Cahoon. "We're the first public utility in the state to receive it." The city now joins the ranks of honorees such as Merrill Lynch, AT&T, Honeywell, the Ritz Carlton Hotels, Boeing Special Operations Forces Aerospace, and Lockheed Martin.

## Small budgets, big returns

The city's most cost-effective method of treating stormwater pollution is to stop it before it enters waterways. An annual \$1.9 million street-sweeping budget captures 2,600 tons of debris at the source. The award-winning Think About Personal Pollution campaign demonstrated that load reductions from education efforts saved \$450,000 annually versus spending an additional \$2.5 million per year on traditional best management practices.

"While these programs have minor expenditures, they are very important to our overall success," says

*(continued)*



City of Tallahassee Stormwater Management project manager Marc Phelps looks over a pond at the Upper Lake Lafayette Nutrient Reduction Facility in Tallahassee, Florida. (Photography by Keyhole Photo/Jeff and Meggan Haller)



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**ABOVE:** Erasmo Mendoza and Facundo Mendoza of Allen's Excavation work on a City of Tallahassee water replacement project. **RIGHT:** Terry Plummer (left) and Paul Davis help align a new piece of concrete pipe that is replacing the old open-ditch stormwater system.

**“Educating citizens about the stormwater program enables them to help us more effectively, and for us to serve the community more efficiently.”**

— Jodie Cahoon

Cahoon. “Working with citizens is the best approach to stopping pollution before it happens.”

To that end, Cahoon visits the city’s two universities four times a year to lecture on stormwater management and planning. A large part of one campus and its parking lots are in low-lying areas. Signs warn students to park at their own risk during heavy rains. “Once they understand the topography, they realize these areas will always be prone to flooding,” says Cahoon.

The city’s annual nine-week Neighborhood Leadership Academy has been another valuable outreach effort. The workshops provide homeowner associations and community leaders with a thorough understanding of government operations, the appropriate approach to bring change to their neighborhoods, and the best ways to access city programs and services.

“Educating citizens about the stormwater program enables them to help us more effectively, and for us to serve the community more efficiently,” Cahoon says. The city even branded the Utilities Department as “Your Own Utilities.”

Under the department’s umbrella, SMG includes the Planning and Administration Division, which administers regulatory compliance, floodplain management, the Stormwater On-Site Mitigation Loan Program, and lakes monitoring. The Pollution Reduction Section coordinates public education and outreach. Public Works Operations sweeps streets and maintains 425 stormwater management ponds, 24 miles of major outfall canals, 25,000 concrete drainage structures such

as manholes and inlets, 430 miles of drainage pipes, 60 miles of drainage ditches, and 370 miles of roadside and outfall ditches spread over 103 square miles. The group includes 95 scientists, biologists, engineers, planners, administrators and maintenance personnel.

### Ounce of prevention

Because homes are a primary financial investment, the SMG floodplain management program participates in the Federal Emergency Management Agency Community Rating System. By providing discounts on flood insurance, the system encourages communities to undertake activities beyond those required by the National Flood Insurance Program.

As part of these activities, SMG sends every property owner in the city’s floodplain an annual letter reminding them that they are eligible for flood insurance. “Properties change hands and awareness is key,” says Cahoon. “Insurance is an excellent tool to minimize losses.”

Besides notifying residents, SMG accurately maps floodplains using ArcGIS software (Esri). Building codes specify structures in floodplains must be built 2 feet above the flood elevation. “We build multimillion-dollar capital projects in areas with repetitive flood losses to help citizens, which also reduces claims to the federal government,” Cahoon says. “For all these activities, FEMA rewarded residents with a 20 percent discount on flood insurance premiums.”

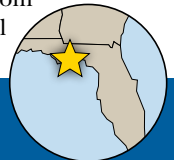
Two staffers administer the Stormwater On-Site Mitigation Loan Program, the only one in the state. “Government can’t fix all problems, so we began this program to help people help themselves,” Cahoon says. The program is restricted to owner-occupied homes. Grants are available for low-income customers.

Under the public relations umbrella, SMG provides low-interest financing, enabling home-

owners to make on-site improvements to prevent or reduce flooding. Using stormwater utility funds, the city provides a loan or grant to hire an engineer and contractor for improvement projects. Loan repayments are included in the customer’s utility bill. Since 2000, more than 112 customers have received over \$300,000 in financial aid.

### Flood relief

Protecting neighborhoods from flooding and erosion requires moving from small fixes to full-scale capital  
(continued)



## PROFILE: Stormwater Management Group, Tallahassee, Florida

**YEAR ESTABLISHED:**  
1987

**CUSTOMERS SERVED:**  
94,500 (stormwater)

**AREA SERVED:**  
103 square miles

**DEPARTMENT STAFF:**  
95

**ANNUAL RAINFALL:**  
60 inches

**INFRASTRUCTURE:**  
425 stormwater management ponds, 24 miles of major outfall canals, 25,000 drainage structures, 430 miles of drainage pipes, 60 miles of drainage ditches, 370 miles of roadside and outfall ditches

**OPERATING BUDGET:**  
\$17.5 million

**WEBSITE:**  
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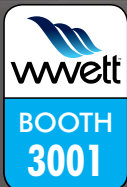
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improvements — the keystone of the stormwater program and recipient of most of the stormwater utility fees. Although the city hires consulting firms and contractors for these projects, SMG has seven project managers (professional engineers

## INNOVATIVE TECHNOLOGY

Fine clay soils make treating stormwater a challenge in Tallahassee, Florida, because particulates don't settle and the clay is rich with phosphorus. To stop pollution and reduce nutrients before they reach Lake Lafayette, engineers with the Stormwater Management Group took a page from municipal water treatment plants and designed a \$7 million enhanced treatment facility upstream from the lake.

The facility has a settling basin to capture some particulates, and a floating debris containment boom (Lamor Corporation) to catch buoyant material. A trash rack snares everything else from shopping carts to roadkill before water enters a rapid-mix basin in which aerators mix alum with the water.

Treated water then enters one of four 193- by 12-foot-deep flocculation basins, where floc forms before discharging to a large settling pond. "As floc settles, it carries suspended particles with it, leaving the water noticeably cleaner," says Jodie Cahoon, P.E., Stormwater Management Group manager. The sediment-rich floc on the bottom of the pond continues to attract nutrients.

Weems Pond, the gemstone of the city's three nutrient-reduction alum treatment facilities, is designed to treat 3 billion gallons of runoff annually. The treatment system is expected to remove 74 percent of incoming total phosphorus, 82 percent of fecal coliform bacteria, 78 percent of sediments, and 25 percent of total nitrogen.

The other two alum treatment facilities, Lake Ella and Cascades Park, are in the heart of downtown. "They are hardscaped, landscaped and serve as passive parks," Cahoon says. Lake Ella was the first alum facility in the state. Cascades Park, the community's newest social center, includes a 30,000-seat amphitheater, interactive water fountain, and miles of multiuse trails.

**"We acquire property through voluntary acquisition. Although negotiations are long, the process develops understanding and trust."**

— Jodie Cahoon

and scientists) who follow each undertaking from inception to completion.

Nobody knows a community better than its residents. "Our project managers work closely with neighborhoods to determine which observations are perceived and which are realities," Cahoon says. "The engineers collaborate with consulting engineers, then they discuss solution alternatives with the community during the design phase." Three in-house construction inspectors, one per project, oversee contractors' work to ensure they meet the city's expectations.

One project involved a 129-acre residential community bisected by an eroded clay-lined control channel. "More than 40 properties flooded, and residents occasionally had to be evacuated by boat," Cahoon says. The canal, conveying runoff from a 3,400-acre urban watershed, produced velocities of more than 10 feet per second. A roadway adjacent to the canal was threatened by flood-

ing and undermining.

To alleviate the problems, the contractor stabilized 1,530 feet of canal with gabion baskets and reno mattresses (Maccaferri Group) and underlined them with woven geotextile material (Ten-Cate Geotube). Workers also used steel sheet piling to stabilize an additional 1,520 feet of channel.

"In gabion baskets, voids between the stone help capture sediment, which promotes vegetative growth and phytoplankton to enhance biological uptake," Cahoon says. "Detention time is excellent because the canal bottom remains wet. It mimics a rock media trickling filter in a wastewater treatment plant."

The \$6.27 million project also included a large secondary drainage system retrofit, and relocating more than 800 feet of utility lines and a 42-inch sewer. It won the 2012 Top Stormwater and Erosion Control Project from *Storm Water Solutions*, a national magazine.



The Tallahassee crew includes (from left) Paul Davis, Alex Evans, Mike Branson, Wilson Thompson, Leo Jones, Eddie Fulton and Terry Plummer.





**City of Tallahassee Stormwater Manager Jodie Cahoon at the Upper Lake Lafayette Nutrient Reduction Facility in Tallahassee, Florida.**

“The depth of competition is deep,” Cahoon says. “Judges select the top 10 stormwater projects in the country based on unique site constraints, obstacles overcome, and goals achieved. While the size and breadth of most projects represent substantial capital investments, the most significant factor is what that money accomplished.”

#### Homes dry and safe

A prime example of what stormwater fees accomplish is the \$2.46 million Eastgate subdivision project, in which up to 30 properties experienced hazardous flooding. As the area upstream developed, the natural drainage channel couldn't convey the runoff, as some areas were narrow enough to leap across.

The first obstacle for SMG was acquiring the property to improve the privately owned channel. “Using eminent domain to take property in an effort to help the owners is government at its worst,” Cahoon says. “We acquire property through voluntary acquisition. Although negotiations are long, the process develops understanding and trust.”

Another obstacle was a 24-inch high-pressure gas main buried under the channel. A year passed before SMG reached an agreement with Florida Gas & Transmission to excavate over the pipe. “We laid ArmorFlex (Contech Engineered Solutions) articulated concrete block mats over the top and sides to protect it,” says Cahoon.

The project improved 3,000 feet of drainage channel. The contractor excavated it to a width of 98 feet at the top, 50 feet at the bottom, and an average depth of 6 feet. Workers installed cascading waterfalls of gabion baskets to dissipate energy, eliminate erosion, and capture sediment to protect a downstream wetland. Phase I earned the 2014 Top Stormwater and Erosion Control Project from *Storm Water Solutions* magazine.

From the top of the hill, SMG looks down on flood-prone areas that have dwindled by numbers and scale, and stormwater improvements that

have reduced nutrients and other pollutants from entering runoff. Ahead lie state regulations pushing to incorporate enhanced water-quality treatment into these projects.

“Whether our targets are total maximum daily load requirements or Florida’s newly adopted numeric nutrient criteria, our engineers are researching innovative designs to protect downstream waters, while mitigating flooding,” Cahoon says. “The challenge will be to spend our resources wisely and effectively improve our community’s valuable natural resources.” ♦

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# HI-VAC IMPROVES A FAVORITE

Modifications to popular 7040 Series jetter make the unit more efficient

By Craig Mandli

Dean Peake, regional sales manager with Hi-Vac, points out some of the features on the O'Brien 7040-SC diesel-powered hydrojetter's hydraulically actuated reel. The unit features variable-speed control on an easy-to-use control panel. (Photo by Craig Mandli)

The Water & Wastewater Equipment, Treatment & Transport (WWETT) Show is a showcase for new innovations. While that means there are hundreds of new products on the show floor, innovative companies often use the show to display updated products as well. One of those — the O'Brien 7040-SC diesel-powered hydrojetter from Hi-Vac — garnered plenty of attention last year.

The diesel-powered trailer jetter comes with plate-mounted 700-gallon-capacity polyethylene water tanks. A built-in tank sump system, which is new, is designed to keep sediment from settling on the bottom of the tanks.

"It's definitely more convenient for the operator," says Dave Sutter, aftermarket manager for Hi-Vac. "The user only needs a shop vac to keep the tanks clean. That's going to appeal not only to municipalities, but also smaller plumbers and other drain and sewer cleaning contractors that maybe don't have a lot of time to devote to cleaning the tanks every day. It can be a huge time-saver."

The hydraulically actuated swinger reel has a variable-speed control and pivots 190 degrees, providing access to the manhole regardless of how the trailer is parked. While previous models came with a square cover cowl, the improved model features a round cover that encloses the air cleaner and exhaust system.

"Overall, the unit weighs less and is easier to clean than the previous model," Sutter says. "The changes cut between 350 and 500 pounds off the finished product, which is a pretty significant chunk."

It is powered by a 65 hp Cummins diesel engine with Murphy safety gauges and variable electronic throttle control. The triplex pump from General Pump is rated to 40 gpm at 2,000 psi. The standard 400-foot, high-impact, thermoplastic sewer hose is easy to clean, maintains stiffness, and is abrasion-resistant. The tandem-axle trailer has a 6-foot channel frame and is rated to carry a full tank of water at highway speeds.

"We typically get a lot of questions and interest in this unit, and this show has been no different," Sutter says. "We get a lot of people who look around at all the jetters at the show, and maybe give a call a few days later. We also have a lot of repeat customers who were looking forward to seeing the changes we made to this model."

The portability of the diesel-powered system makes the O'Brien 7040-SC a versatile, do-anything choice. "It's a great unit for cleaning grease traps as well, in addition to day-to-day sewer line cleaning," he says.

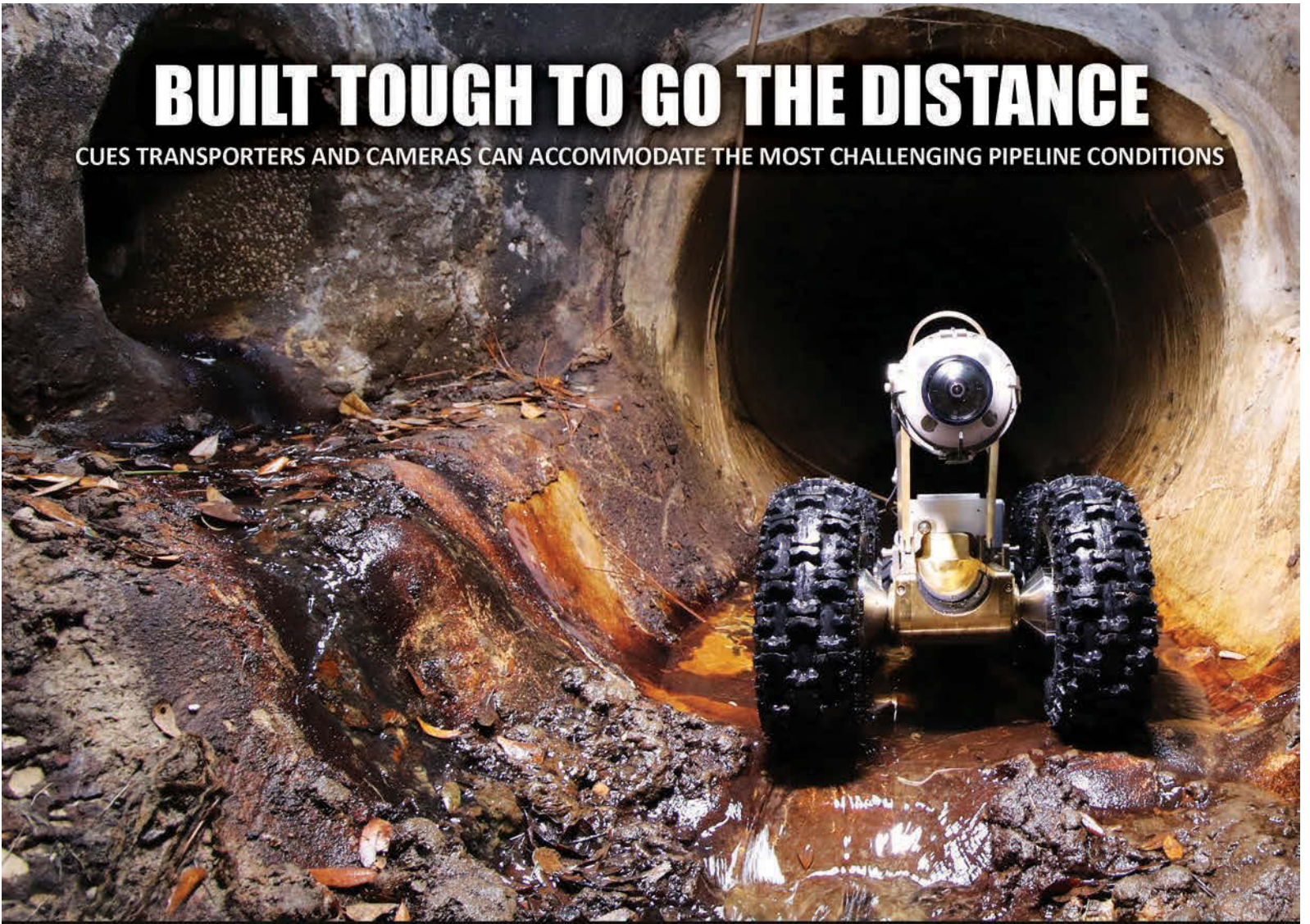
Sutter says Hi-Vac chose to feature the 7040-SC at the 2015 WWETT Show simply because company leaders figured its versatility would appeal to the diverse crowd.

"That's the great thing about this particular show: You could be talking to a municipal sewer director one minute, then to a large plumbing contractor with franchises all over," he says. "We love talking to the smaller contractors as well, and there's a place for this unit with them, too. That dynamic is what makes this the biggest show in this industry." 800/638-1901; [www.obrienmfg.com](http://www.obrienmfg.com). ♦



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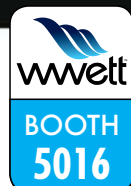


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595 companies - list current as of Jan. 4, 2016.

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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

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

Rooms 136-138

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

## 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 Panel Discussion

## Treatment Plant Operator

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.

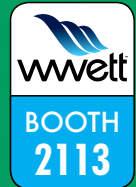




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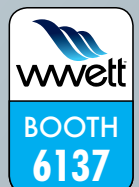
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# NO MORE TIERS

Diesel manufacturers explain what's changed — and what hasn't — with off-road equipment under Tier 4 Final standards

By *Peter Kenter*

Off-road diesel engines have made significant strides since the Environmental Protection Agency first adopted Tier 1 emission standards in 1994. Tier 4 standards have been phased in since 2008, with the strictest Tier 4 Final requirements to reduce nitrogen oxides and particulate matter incorporated last year and this year.

However, Tier 4 Final standards are outcome-based, not prescriptive — each manufacturer is permitted to achieve outcomes using its own solutions and technology. On hand to discuss their approaches are: Joe Mastanduno, account manager, Rental Marketing, with John Deere's Construction and Forestry Division, and Brad Stemper, solutions marketing manager with Case Construction Equipment.

## **MSW: What differences will operators see in off-road vehicle engines in Tier 4 Final?**

**Stemper:** Selective catalytic reduction (SCR) has allowed manufacturers of excavators and other machines to meet the NOx standards of Tier 4 Final most efficiently. Our excavator solution involves a more efficient SCR system in combination with a diesel oxygen catalyst that uses a chemical process to break down particulates into less harmful components, reducing overall emissions by up to 95 percent. We didn't want to stack up technologies that could use more fuel, affect peak horsepower or force us to redesign the machine envelope for technologies that would adversely affect our purchase prices, particularly on small- to medium-sized equipment.

**Mastanduno:** Our approach at John Deere has been to build on proven technologies, including cooled exhaust gas recirculation (EGR), exhaust filters, and variable-geometry turbochargers. We refer to this as the building block approach. Particulate matter levels established in our Interim Tier 4 designs will be maintained while NOx will be further reduced by about 80 percent. This NOx reduction will drive the need for a new technology called SCR to be added to engines above 75 hp. This technology will require an additional fluid called diesel exhaust fluid (DEF), therefore a tank, lines, pump and nozzle are all new components associated with Tier 4 Final. Due to the continued usage of cooled EGR, the DEF consumption will be quite low which allows for smaller DEF tanks and lower DEF costs.

## **MSW: How do these changes benefit users?**

**Stemper:** Users don't care about how Tier 4 Final is being resolved. They want a machine that runs the same, offers the same or better efficiency, costs less, and earns them more money. We used the emission man-

date as an opportunity to improve our machines. For example, we looked at ways to integrate hydraulics and electronics to create a variety of work selection modes and make the machines more efficiently leverage movement and stored power.

**Mastanduno:** Aside from the obvious benefit of lower engine emissions, John Deere has worked to provide additional benefits as well. A great example of this is in the telematics, which create the ability to monitor engine performance remotely, diagnose any problems and report them to the owner. We can also update diagnostic software remotely and seamlessly using our exclusive communications tool, JDLink.

## **MSW: Have Tier 4 Final engines sacrificed any power?**

**Stemper:** Power hasn't been sacrificed between Tier 4 Interim and Tier 4 Final because power range is still a deciding factor in purchase. On earlier versions, we reaped the efficiencies of going electronic, using high-pressure common rail fuel delivery and increasing performance with reduced engine size, so we haven't sacrificed horsepower with Tier 4 Final.

**Mastanduno:** People aren't willing to sacrifice power or torque. Through all of the changes, the power and performance of our engines have remained the same with no degradation in reliability, responsiveness or ease of operation.

## **MSW: Are there any increased requirements for maintenance?**

**Stemper:** The SCR system found in our new excavator line requires the use of DEF. However, as a whole the equipment is migrating to a longer life cycle, longer time between oil changes, and longer service intervals. There's no diesel particulate filter that needs to be changed, and no related regeneration.

**Mastanduno:** The exhaust filter is integrated into the engine design, which continuously regenerates and cleans it during normal engine operation without operator involvement. The initial EPA requirement was that diesel particulate filters needed to last 3,000 hours before ash removal. We're now up to 10,000 to 15,000 hours, which is often the life cycle of construction equipment before people retire or sell their machines. Operators will now have to change a small DEF filter along with routine maintenance.

## **MSW: Have users become more savvy about maintaining supplies of DEF?**

**Stemper:** The industry has adapted to that, primarily because the trucking industry drove demand before off-road requirements were phased



in. Customers in remote locations are now seeing fuel delivery trucks carrying DEF. As Tier 4 Final becomes applicable to vehicles with lower horsepower, we're now seeing a brand-new customer base being exposed to the need for DEF for the first time — owners of skid-steers and backhoes, and small landscape companies, for example.

**Mastanduno:** Fueling companies have adapted well to the market needs and they're routinely supplying DEF along with diesel fuel. DEF can be purchased in numerous ways ranging from simple 2-gallon jugs to bulk delivery.

**MSW: Any new engine monitors or alarms?**

**Stemper:** One change is that some systems no longer require operator intervention. For example, the SCR technology doesn't require the operator to regenerate the system. In short, there are fewer bells and indicators in our Tier 4 Final.

**Mastanduno:** We've added sensors and monitors to the equipment, but we didn't want to add flashing lights just because something is happening. Do you need to see a light flashing when a filter is going through a self-cleaning cycle? Manufacturers struggle with the right level of information to provide the operator, and we will only flash a light when it's something that requires action from the operator.

**MSW: Does Tier 4 Final offer retrofit possibilities?**

**Stemper:** Today's engines are very complex, from electronic engine management, to exacting exhaust pressures entering the catalytic chamber and leaving it. To retrofit, you not only have to add equipment, but understand how it works with every other part of the engine, and then go through the process of finding a way to monitor it. I would say it is difficult and becomes cost-prohibitive to the owner.

**Mastanduno:** Retrofitting will continue to be an option for those who own older machines and have a need to bring the emissions up to a higher standard than what they were originally designed to meet. This need is often tied to certain contracts or local air-quality requirements. At this time the retrofits John Deere offers will improve both PM and NOx emissions but generally are not capable of achieving Tier 4 standards.

**MSW: The EPA is always looking to the future. What could Tier 5 look like?**

**Stemper:** Europe is currently looking at implementing standards for CO2 exhaust emissions. We're hearing rumblings in the industry that this might be introduced in North America, but nothing has been formally decided yet.

**Mastanduno:** If it does happen, we might see attention paid to smaller particulates or fuel consumption controls. However, for off-road vehicles, setting a standard for fuel consumption could be very difficult. How do you measure the fuel efficiency of a skid-steer against the efficiency of a motor grader? ♦

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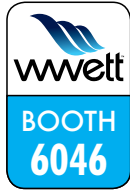


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# TIME FOR SOME STRAIGHT TALK

If employees feel disengaged from your organization, it's time to restore the connection – with fierce transparency

By Ken Wysocky

Employee engagement is one of the biggest hot-button issues facing employers these days. As well it should be: Studies consistently show that disengaged workers contribute heavily to lost productivity, low morale, high absenteeism and costly turnover, to name just a few of the detrimental side effects.

There is no lack of solutions out there. In fact, a Google search on the topic reveals a staggering amount of information — more than 214 million hits. But Susan Scott believes it's not all that complicated. Instead, the founder and chief executive officer of Fierce Inc. ([www.fierceinc.com](http://www.fierceinc.com)), a leadership development and training firm, proposes a two-pronged approach that's simple, effective and doesn't cost a dime: Create a culture where management connects with employees through "fierce" conversations and operates with transparency at all levels.

"Organizations must connect with employees — and customers — at a deep level," says Scott, the author of two best-selling books, *Fierce Conversations: Achieving Success at Work and in Life One Conversation at a Time*, and *Fierce Leadership: A Bold Alternative to the Worst "Best" Practices of Business Today*. "Human connectivity is where it's at right now. It's the next frontier for exponential growth for both individuals and organizations — it provides the only sustainable competitive edge. And most companies just are not there yet."

To support her contentions, Scott cites some interesting data gathered through an employee engagement survey conducted by TINYpulse, a Seattle-based company. Here's what the survey discovered from polling more than 40,000 employees at 300 companies around the world:

- Transparency is the No. 1 factor that contributes to employee satisfaction and happiness.
- Team play and collaboration are among the top traits employees love about co-workers.
- Only 42 percent of employees know their organization's vision, mission and values.
- In terms of happiness, having great colleagues is way more important than having good managers.

"In addition, 41 percent of the people that our company recently sur-



**"If things aren't transparent, employees feel that keenly and deeply. And if you don't give them information, they'll fill that vacuum on their own with rumors."**

— Susan Scott

veyed believe that negative attitudes are the most detrimental factor in the workplace," Scott adds. "They affect morale and productivity and raise stress. About 23 percent of employees try to ignore (those with negative attitudes), and only 47 percent of employees believe managers would actually fire those toxic employees. And 88 percent believe that even if a person has amazing skills, that doesn't compensate for toxic behavior."

So how do transparency and meaningful conversations factor into all this? Let's start with transparency. In short, being open and honest is critical. That's true whether it's something as broad as sharing pertinent news and information (both good *and* bad) and talking about challenges the organization faces, or as small as forthrightly explaining to employees where they're underperforming, Scott says.

"One reason we do so much business worldwide is that people are afraid to be completely honest and transparent," she notes. "We teach people the skills to be completely honest and to enrich relationships, not harm them — take the fear out of transparency."

"If things aren't transparent, employees feel that keenly and deeply," she continues. "And if you don't give them information, they'll fill that vacuum on their own with rumors. Moreover, you need to invite employees to weigh in on topics. One big thing about engagement is inclusion. ... Employees want to be viewed as valuable collaborators when companies set goals or solve problems."

Companies where managers don't hold employees accountable — especially those who are toxic — aren't being transparent and, as such, hurt other employees who only want to get along and do good work.

Why is this so difficult for some managers? Most of them find it difficult to confront others, so they avoid issues instead, Scott asserts. "Generally speaking, we're not taught how to do it," she says. "And it's not easy to do even for people who have the skills. So managers put off talking about problems until it's 'exactly the right time' — when the sun, moon and stars are exactly aligned. They wait and wait and wait and it doesn't happen, and meanwhile this person continues to wreak havoc behind the scenes. And suddenly you have a real problem."

**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).



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If managers just can't find it within themselves to handle issues with honest conversations or develop close relationships with employees, then they shouldn't be managers, Scott contends. "If someone is fundamentally hardwired in such a way that they can't do those conversations or get close to employees, there are other jobs they could and should do," she says. "I wouldn't give up on that person right away, but I'd tell them if they want to advance, there's an area where they're lacking — 'Let's get you some training and talk about the impact your reluctance to have these conversations has on your career and your co-workers.'"

Meaningful and "fierce" conversations are a necessary component of transparency. In fact, Scott says conversations are the single most important tool companies have for engaging people — as well as the most overlooked. "The conversation is the relationship and our most valuable currency is relationships — it's emotional capital," she explains. "Most conversations sort of water ski over the issue — skate along the surface. But it's entirely different if you scuba dive below the surface, where there's a whole other world."

In the end, business is fundamentally nothing more than an extended conversation with both employees and customers, and unfortunately, most companies fall short of where they need to be, she concludes. "Employees desire more than just coming to work and doing a good job, and customers want more than just a fair price," she explains. "They want connectivity — close, playful, happy and fun relationships with people they interact with every day. And without that connectivity, employee engagement suffers."

"Organizations need to understand that they succeed or fail one conversation at a time, and it's the missing conversations that cause the biggest problems," she adds. "They need to accept that this is a skill set that's critical to success." ♦

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# EXPERT ANSWERS TO TOUGH QUESTIONS

Online technical FAQ section provides a wealth of information for trenchless professionals

By Ted DeBoda, P.E.

Sharing information and knowledge is NASSCO's core activity. That's why we work hard to make educational resources as accessible as possible by including them on the NASSCO website (nassco.org), where visitors can learn something new every time they visit.

One of the many resources available to Web visitors is our Frequently Asked Technical Questions section, with questions collected from the field and responses from industry professionals. Below are examples of a few of the questions we have received, along with NASSCO's objective answers:

**Q. Should rehabilitation projects be contracted as design/build? This would reduce the CCTV work.**

**A.** Design/build is used by some municipalities for larger projects. However, it may not save on CCTV work. The lines need to be televised during the design to assess the condition. The post-preparation CCTV gives the owner a visual verification that the system is ready to be rehabilitated to specified requirements. The pre-lining CCTV confirms that the line is clear of all foreign materials, and the post-CCTV inspection confirms that the liner has been installed correctly.

**Q. Do you only do lateral rehabilitation after mainline rehabilitation? If you do any lateral rehabilitation prior to mainline rehabilitation, are there any special considerations?**

**A.** Not always, but you would want to seal the connection after the main is

lined. If the laterals are rehabilitated first and then the mains, there is a high risk of damaging the lateral seal when opening the lateral connection with a robotic cutter.

**Q. Which is the best curing process?**

**A.** There are three principal cure processes for mainline CIPP: hot water, steam and UV. Of these three, there is not a best process. Site conditions and pipe parameters may favor one process over the others, but it is often best to allow for multiple curing processes in the specifications and let the installer choose the best method for the installation at hand.

These are just three of hundreds of questions posted in categories that include general trenchless technology, CIPP, PACP, sewer cleaning, infiltration control/grouting, laterals and specification guidelines. In addition to the Frequently Asked Technical Questions section on nassco.org, you will find other educational resources, including webcasts, the PBS documentary *Liquid Assets* (which tells the story of essential infrastructure systems: water, wastewater and stormwater), resources for supplemental education, and more.

Asking good questions and sharing information is one of the best ways to help NASSCO achieve its mission to set standards for the assessment and rehabilitation of underground infrastructure and ensure the continued acceptance and growth of trenchless technologies. Visit nassco.org to learn more. ♦

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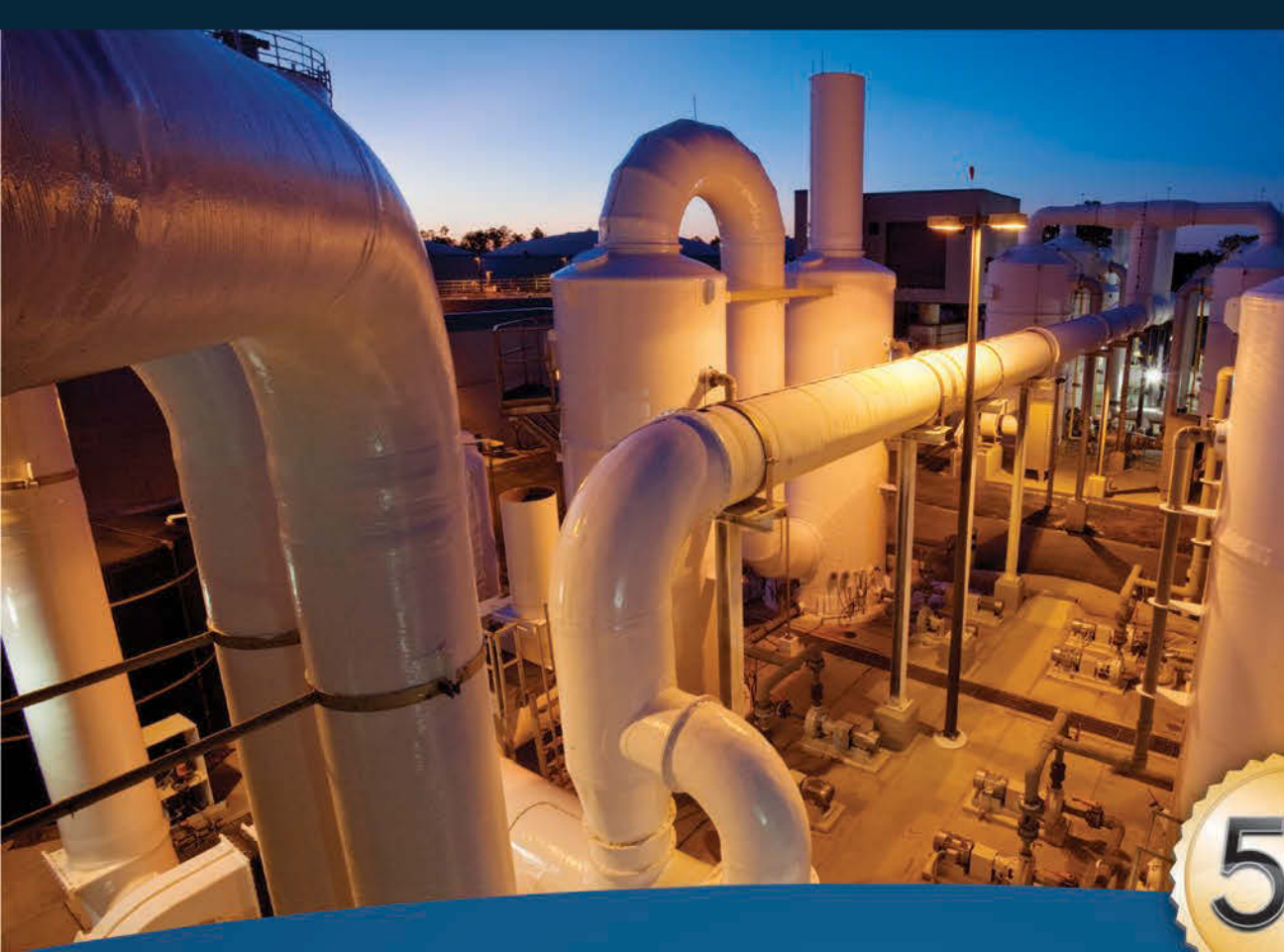
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The **Pentair Southern Cross SX Solids Pumps** are compressed-air operated, offering a solution for transferring solids and abrasive materials. There is no contact between the product and moving parts. They are built with minimal wearing parts and are easy to service. They have the ability to handle solids up to 70 to 80 percent of

the hose diameter, with transfer distances up to 3,281 feet on larger units. They can be easily operated by one worker or set up for automatic operation, and are available with capacities up to 15,850 gph and fully enclosed for zero discharge of waste into the atmosphere to comply with environmental requirements. **514/235-9941; www.southerncross.pentair.com.**

**Zoeller Company Submersible Solids Handling and Grinder Pumps**

**Submersible Solids Handling and Grinder Pumps** from **Zoeller Company** have finned castings, oil-filled housings and non-overloading windings that enable the motor to maintain a low operating temperature when facing harsh conditions. Solids handling pumps are available in 1 to 100 hp, and have a 3- or 4-inch solids handling capacity with two-vane or vortex-impeller styles. Grinder pumps are available in 1 to 7.5 hp, and have a star cutter with shearing action that keeps the cutting surfaces clean and assures the user of a clog-free pumping unit. They are available with either a standard or explosion-proof motor. **800/928-7867; www.zoellerengprod.com.**



**VALVES**

**Asahi/America Speed Handle**



The **Speed Handle** manual butterfly valve kit from **Asahi/America**, including the Plasgear hand wheel and attached grip, allows for smoother and faster single-handed revolutions of the hand wheel for quicker valve actuation. The hand wheel is available in red and blue PPG for the Type-241 and Type-243 Plasgear gear operator. The grip is Nylon 6 (black) with a stainless steel 400 chromate-treated M10 bolt and stainless steel M10 hex

nut. **800/343-3618; www.asahi-america.com.**

**Mainline Backflow Products Straight-Fit Backwater Valve**

The **Straight-Fit Backwater Valve** from **Mainline Backflow Products** has a flapper designed to smoothly guide cleaning and surveying equipment through the valve and allows for safe withdrawal, minimizing risk of damage to the flapper. The addition of a



Smart-Curve snake guide prevents damage to the valve body during snaking from the main access. The valve body design has minimal slope, making it ideal for new installations and retrofits. **877/734-8671; www.backwatervalve.com.**

**Singer Valve 106-RPS-8700**



The UL/FM-labeled and listed **106-RPS-8700** pressure-relief valve from **Singer Valve** automatically relieves excess pressure in the fire protection system to discharge. It will automatically modulate to relieve excess pump capacity during pump startup and shutdown, allowing the pump to operate without causing surges. It is based on 106-PG or A106-PG main valves and comes in a complete range

of sizes from 2 1/2 to 8 inches. In typical pressure-relief applications, the angle-style valve is often the preferred selection. Prior to shipment, testing includes UL- and FM-approved hydrostatic pressure tests and a full function and operation test. **604/594-5404; www.singervalve.com.**

**Smith & Loveless RapidJack**

**RapidJack** clean check valves from **Smith & Loveless** eliminate the need for time-consuming valve disassembly and interim piping realignment. Technicians can quickly access the pipe by opening the valve's top and pulling the arm assembly up and out. This simple process consists of removing four bolts, detaching the spring, and lifting it free from the check valve body. Once it is out, the technician can clear any obstructions and remove any stringy items from around the arm. After a quick clean, they insert the top piece back into the body, replace the four bolts, and put the pipe back in service. The entire process typically takes less than 15 minutes. **913/888-5201; www.smithandloveless.com.** ♦



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## Storm drain system succeeds for mega-mall project in salt marsh



**Problem:**

A new 182-acre mega-mall in British Columbia required a large storm-water management system that could provide corrosion resistance to the salt marsh on which is being built, and structural strength because of the poor deltaic soil conditions in this seismically active region of Canada. Portions of the system would be installed under public roads. The two

projects on the peninsula jutting into Boundary Bay are Tsawwassen Mills, an enclosed shopping mall with approximately 1.2 million square feet of retail space, and Tsawwassen Commons, a retail outlet with 555,000 square feet of outdoor retail space. The project is expected to be completed in summer 2016 and will include 6,000 parking spaces.

**Solution:**

For the stormwater drainage system, more than 4,920 feet of **SaniTite HP** from **Advanced Drainage Systems** was used in diameters from 12 to 60 inches. In addition, 12 risers were fabricated using the pipe, each with an access ladder. Cover over the pipe ranged from 18 inches to 7 1/2 feet, and the backfill used was Class 1 crushed 3/4-inch angular stone.

**RESULT:**

The pipe provided a quick, contractor-friendly installation. The high beam strength, in addition to the pipe's light weight and simple bell-and-spigot joints, allowed the crew to install more than 197 feet per day. Installed on a 0 percent grade, the pipeline acts as a holding tank as well as a conveyance system, allowing water to enter nearby ditches and be used by local farmers for irrigation. **800/821-6710; www.ads-pipe.com.**

## Knife gate valves used to restore salmon habitat



**Problem:**

In the early 1900s, two dams were built on the Elwha River in the Olympic Peninsula, Washington — the Elwha Dam in 1914 and Glines Canyon Dam in 1927. In 1992, full restoration of the Elwha River ecosystem was mandated by Congress to restore migrating salmon habitat and dramatically change the watershed.

Lake Aldwell, a reservoir made by Elwha Dam, needed draining before the

dam was blasted; it was necessary to remove silt from the reservoir as it emptied.

**Solution:**

Five knife gate valves, fabricated by **Lined Valve Company**, were placed near the dam wall. All were bonneted (to reduce packing leak) and metal seated. They included two 72-inch, two 48-inch, and one 36-inch valve. Each was built with a carbon steel body, yoke and bonnet, and stainless steel gate, packing gland, stem and wetted parts. The seats were also stainless steel but with a welded bronze overlay. The valves were designed to 25 psi CWP, with TLSP packing, and electric motor actuators. These knife gate valves ensured clean, sediment-free flowing water.

**RESULT:**

The knife gate valves operated for a few years as the reservoir emptied. The salmon population is recovering, riverbanks and gravel bars are rebuilding, and estuary habitat is growing. **888/256-5779; www.linedvci.com.**

## Gate valves used on infrastructure repair program



**Problem:**

In fall 2014, Oscar Renda Contracting was in the midst of the \$116 million "North Contract" — one of Biloxi, Mississippi's largest municipal public works projects ever, representing the bulk of the city's recovery projects from Hurricane Katrina. The company was contracted to replace water mains, sanitary sewer lines, storm drains and pump stations.

**Solution:**

Consolidated Pipe & Supply provided over 1,300 of **Mueller Co.'s A-2361** 350 psi resilient wedge, ductile iron gate valves. In addition, over 400 Super Centurion 250 fire hydrants and 2,500 pieces of service brass were shipped to the project. Supplied in sizes ranging from 2 to 12 inches, the A-2361 has dual-purpose lifting lugs, a user-friendly T-head bolt retention design, and a pressure-assist wedge geometry. The dual-purpose lifting lugs provide stability and alignment for the valve box. Secondly, all valves with a mechanical joint connection contain a nesting area for T-head bolts to prevent rotation during pipe installation, improving site safety, speeding installation, and resulting in a watertight connection. The shape of the iron wedge casting and the elastomeric encapsulation are designed to provide positive stop without overstressing the elastomer or epoxy lining.

**RESULT:**

The A-2361 gate valves have performed as advertised, without a problem. **800/423-1323; www.muellercompany.com.**

## Expanders used to fit and seal odd-sized clean-outs and pipes

**Problem:**

A Midwest energy contractor inspecting municipal sewer laterals needed a dependable non-leaking expansion plug for odd-sized pipes and clean-





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outs where conventional expansion plug sizes of 3 inches were too small and 3 1/2 inches were too large to seal and fit the clean-out opening.

#### **Solution:**

The contractor installed 3 1/2-inch flexible neoprene **Real-Tite Expansion Plug Expanders** that adapt over the 3-inch Real-Tite Standard Sized Expansion Plugs.

#### **RESULT:**

The expanders provided a larger range of expansion, creating a leak-free solution that fit the odd-sized opening. The expansion plugs and adapters are watertight, easily removable and can be reused for future inspections. **800/877-0610; www.real-titeplugs.com.**

## University fights drought conditions with reclaimed water program

#### **Problem:**

As a public research university, UC San Diego is aware of California's ongoing water shortage and embarked on a plan to leverage the availability of reclaimed wastewater in the San Diego area to further reduce the reliance on imported water in San Diego County.



#### **Solution:**

When planning its reclaimed water project, the university relied on its prior use of horizontal directional drilling with **Fusible PVC** pipe from **Underground Solutions** to design an extensive distribution network with minimal campus and environmental disturbance. The project not only provides reclaimed water for irrigation systems that maintain the landscape, but also supplies water for the campus cooling tower complex, significantly reducing the potable water load. The project included 4,800 feet of 12-inch fusible PVC pipe in eight different horizontal directional drills through the heart of the campus. HDD

installation protected the natural environment of the campus and minimized both vehicle and pedestrian disruption. Several of the directional drill pullbacks were completed at night and on weekends to minimize impact. Construction costs were minimized by crossing underneath many of the existing utilities and roadways across the campus.

#### **RESULT:**

“Underground Solutions continues to bring added value to our projects throughout San Diego County,” says the project's engineer, Greg Kump of Nasland Engineering. “They provide technical assistance during design, supportive guidance to bidding contractors, and cooperative, professional teamwork on the job site. Their project design and construction support is unique as a pipe supplier.” **858/679-9551; www.undergroundolutions.com.** ♦



# Product Spotlight

## U-TECK Safe-T Lid prevents falls into manholes

By *Luke LeNoble*

**S**afe-T Lid temporary manhole covers from U-TECK provide fall-in protection while the manhole or hand-hole lid is removed. Made from high-impact-resistant composite, each lid weighs 11 to 14 pounds and can support up to 400 pounds of direct weight.

“The Safe-T Lid is a safety device that you can put over the manhole opening after the permanent lid has been removed while you’re doing work in the manhole, like sewer inspections,” says U-TECK Vice President Russ Mason. “It’s an extra precautionary device in case someone was walking at the work site and happens to fall in.

“That’s really the main reason why we came up with this, just to keep people from falling in and protecting municipalities from work site accidents,” he says. “It’s very inexpensive insurance, and they take up very lit-



tle space in a van or a truck.”

Openings along the edge of the Safe-T Lid accommodate cables, ducts or hoses. Hand openings allow for easy transport, placement and removal.

“It’s very lightweight,” Mason says. “Two hand holes are cut into each of these lids that a person can hold onto and lower it directly into that manhole opening; it sets firmly on the flange. They just drop in.”

Custom sizes and engraving are available. Lids come in high-visibility yellow or orange.

“It’s not just a physical barrier, it’s a visual barrier, too,” Mason says. “If someone sees this yellow lid, they’re less likely to walk near it or step on it.” **800/542-7011; [www.uteck.com](http://www.uteck.com).**

## Industrial Video & Control HD camera

The APTZ-3045-06 high-definition industrial video camera from Industrial Video & Control is designed and certified for use in hazardous environments. The 30x color pan-tilt-zoom camera offers 1080p resolution and low-light performance. The camera integrates with third-party security systems or can be operated through a SCADA system. **781/255-7400; [www.ivcco.com](http://www.ivcco.com).**



## Onset Bluetooth water level data logger

The MX2001 Bluetooth low-energy-enabled water level data logger from Onset, in partnership with CAS DataLoggers, is designed for wireless communication with mobile devices. Applications include monitoring water levels in streams, lakes, wetlands, tidal areas and groundwater. **800/956-4437; [www.dataloggerinc.com](http://www.dataloggerinc.com).**



## Mr. Manhole manhole cutter

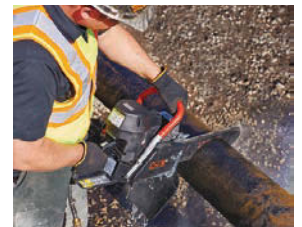
The Gold Series Six Shooter from Mr. Manhole is an upgrade to the company’s premier manhole cutter. Features include enhanced power, speed and durability. Attached to a skid-steer, the manhole cutter has improved

cutting surfaces, a heavier frame, Quick Adjust variable cutting diameter that ranges from 28 inches to 72 inches, and a custom heavy-duty auger drive. A minimum flow of 30 gpm and 2,500-pound minimum lifting capacity is required. **419/741-9075; [www.mrmanhole.com](http://www.mrmanhole.com).**



## ICS pipe cutter

The 680PG-10 PowerGrit Utility Saw from ICS, a Blount International Brand, is designed to cut plastic pipe and ductile iron pipe up to 10 inches in diameter. The 680ES engine platform features a 76.5 cc, 5 hp engine and a direct-drive clutch to prevent slipping in wet conditions. **800/321-1240; [www.icsdiamondtools.com](http://www.icsdiamondtools.com).**



## Infrastructure Repair Systems elbow spot repair system

The Trenchless 90-Degree Elbow Spot Repair System from Infrastructure Repair Systems is designed to seal joints, cracks or missing sections within the 90-degree curve of any 4- to 6-inch pipe. **877/327-4216; [www.irsi.net](http://www.irsi.net).**



(continued)



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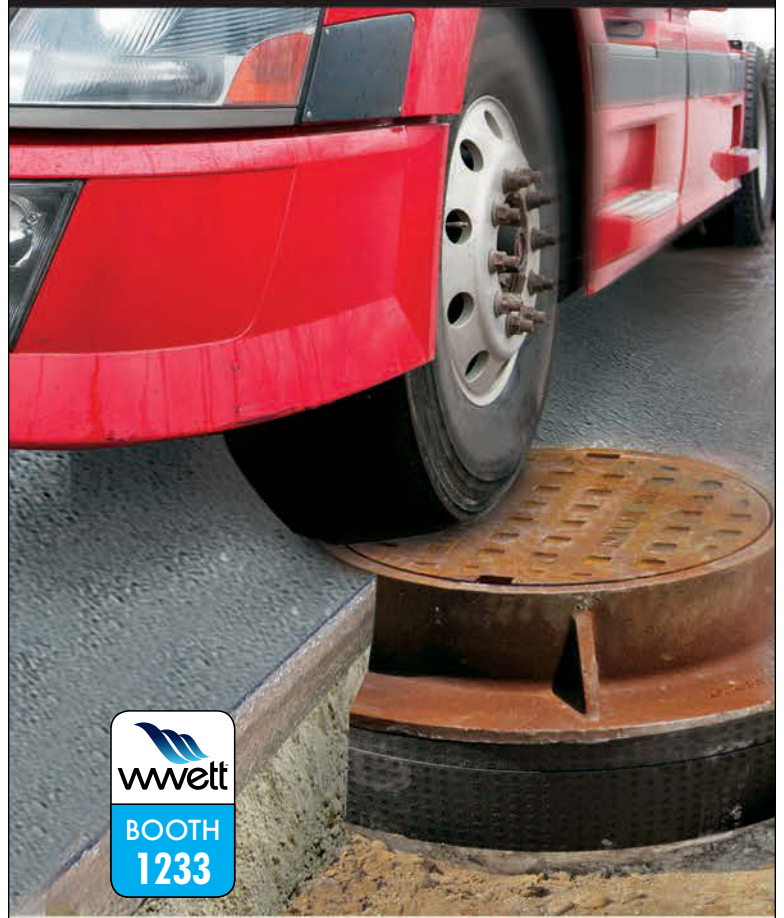
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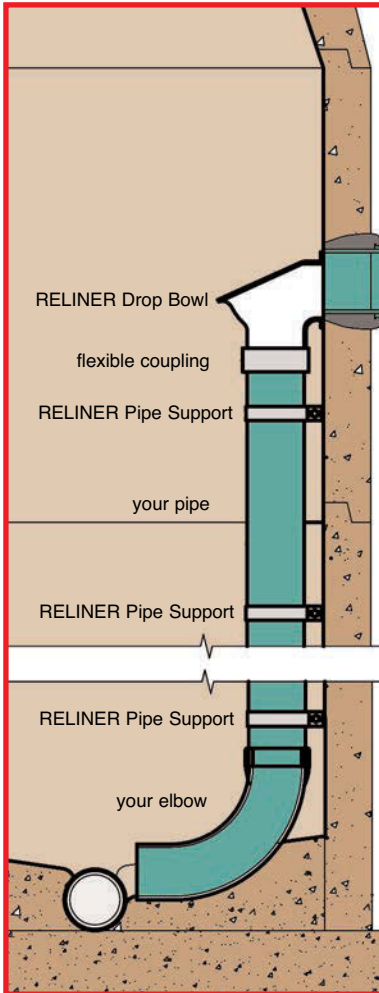
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The 16T52, two-wheel commercial jetter trailer from Water Cannon has a 500-foot by 3/8-inch hose reel capacity, 200-gallon water tank with float valve, polyurethane toolbox, lights, front jack with wheel, safety chains and aluminum fenders. The commercial high-pressure jetter has a Vanguard 18 hp electric-pressure engine with 15-gallon fuel tank, TS Series General triplex plunger pump (5.5 gpm, 3,500 psi), 8-foot jumper hoses, and three jetter nozzles (penetrator, flusher and degreaser/deicer). **800/333-9274; www.watercannon.com.**



## Hot Jet USA trailer-mounted jetter

The HotJet III from Hot Jet USA is a trailer-mounted water jetter with two 35 hp Vanguard engines, featuring 20 gpm of hot or cold water at 3,850 psi. It is designed to clean lines from 2 to 24 inches with the proper nozzles and features a wireless remote control with a range of up to 300 feet and includes 500 feet of 1/2-inch hose, 300 feet of 3/8-inch hose, and 100 feet of sanitary hose; 1/4-inch line is also included for laterals. Included is the choice of a 300- or 660-gallon water tank and a 5-foot by 14-foot tandem-axle diamond plate trailer. **800/624-8186; www.hotjetusa.com.**



## Perma-Liner lateral connection solution

The InnerSeal lateral repair and main-line connection from Perma-Liner Industries is a one-piece structural and continuous main-to-lateral CIPP that completely seals the connection while renewing the lateral. It meets ASTM F2561-11. **866/336-2568; www.perma-liner.com.**



## American-MC outdoor water sampling station

The EZ-01F outdoor water sampling station from American-MC features a weather-tight sealing closure with wind and rain guards for a pristine testing environment. The three-position, spring-loaded aluminum lid seals flush to protect the sampling station against weather, infestations and other contaminants. An integral keyed master lock or stainless steel hasp for a padlock is included for added security. When sampling during inclement weather, the lid's second position forms a cover over the sampling area to deflect rain and snow. Side wind guards work with the lid to protect against contaminants being blown into the sample. When weather is not a factor, the lid's third position becomes a secure shelf that can hold up to 35 pounds. **805/642-9924; www.american-mc.com. ♦**





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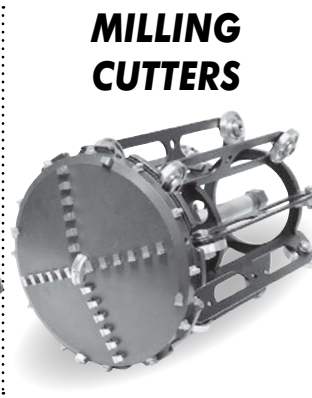
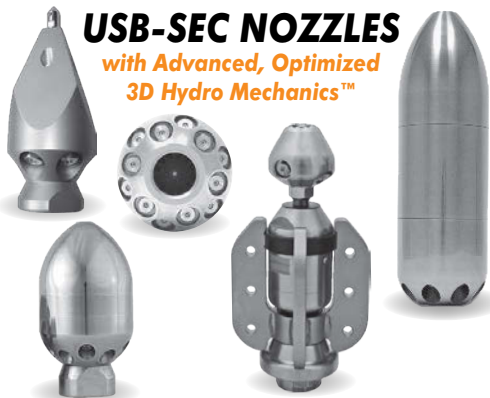
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**Veolia partners with Greentown Labs**

Veolia North America became a Terawatt sponsor of clean-tech incubator Greentown Labs. Greentown assists energy-focused startups with resources they need to move from prototyping products and services to pilot testing and first customers. Located in Boston, Greentown provides 40 member companies with 33,000 square feet of lab space, a machine shop and 3-D printer.

**GE forms power company**

GE combined GE Power & Water and Alstom Power to form GE Power. Headquartered in Schenectady, New York, Steve Bolze will serve as president and CEO of the new company.

**Aqua-Aerobic merges with METAWATER**

Aqua-Aerobic Systems of Loves Park, Illinois, merged with METAWATER Co. of Tokyo, Japan. Aqua-Aerobic Systems, including its subsidiary, Mecana Umwelttechnik of Switzerland, will be part of METAWATER USA, the company's U.S. subsidiary with operations in Rutherford, New Jersey.

**Vanair announces expansion**

Vanair Manufacturing acquired an 80,000-square-foot manufacturing facility in Michigan City, Indiana, to accommodate increased growth and future expansion. The acquisition brings the company's total pro-

duction and office space to over 160,000 square feet. The new facility will provide capacity for increased manufacturing, training, support, service and leadership functions across the company.

**Cloverleaf Tool Co. purchases Jetter Parts Depot**

Cloverleaf Tool Co. of Sarasota, Florida, manufacturer and distributor of pipeline and sewer cleaning and maintenance equipment for jetters and jet/vacs, purchased Jetter Parts Depot of Orlando, Florida.

**McElroy adds new distributor in Louisiana**

McElroy Manufacturing added a new distributor, Industrial Municipal Supply Co. of Geismar, Louisiana, to service pipe fusion machine customers throughout the state. IMSCO has 40 years of experience in custom fusion service, on-site fabrication and maintenance on McElroy machines in addition to being a supplier of HDPE pipe, valves and fittings.

**Vermeer names Andringa president, CEO**

Jason Andringa assumed the role of president and CEO at Vermeer effective Nov. 1. The announcement was first made in August as part of the company's family-succession planning process. Andringa previously served as president and COO, in addition to a number of other roles since joining the company in 2005.



Jason Andringa

**Hanson Building Products changes name**

Hanson Building Products changed its name to Forterra following the recent sale of the company. The company will continue to operate its five U.S. and Canadian divisions as well as its building products division in the United Kingdom. Plans are to continue production of all existing product lines through its 130 facilities.

**Aclara Technologies acquires electric meters business**

Aclara Technologies announced that its affiliate has signed an agreement to acquire the electricity meters business currently operating within GE Energy Management's Grid Solutions subdivision, also known as GE Meters. Terms of the transaction were not disclosed.

**Envirosight names channel development manager**

Envirosight named Steve Webster channel development manager. He will split time between product and service management for the company's regional sales partners. ♦

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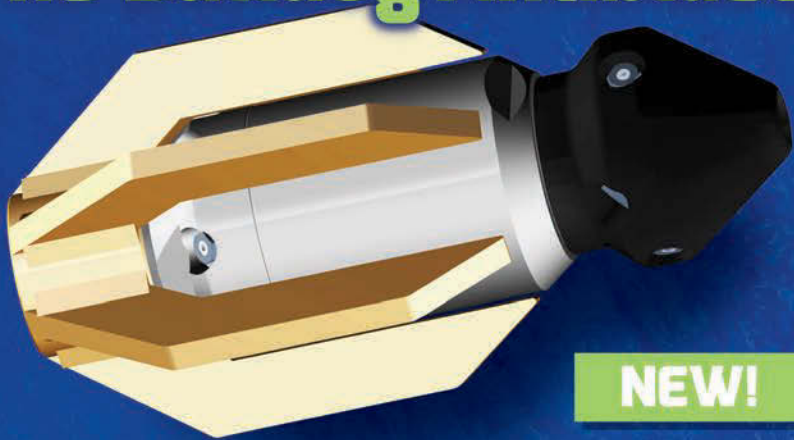
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Gainesville Regional Utilities is seeking qualified candidates to fill two managerial vacancies within the Water/Wastewater Department; Water/Wastewater Facilities Operations & Maintenance Manager and also for a Water Distribution & Wastewater Collection System Director. For further information and/or to apply, visit: [www.cityofgainesville.jobs](http://www.cityofgainesville.jobs) EOE/AA/DFWP/VP (M02)

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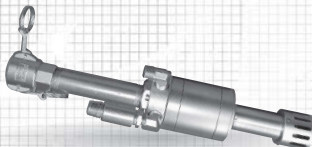
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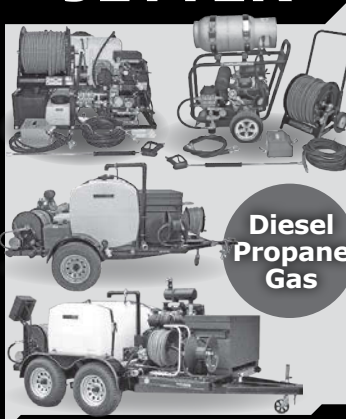
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## PEOPLE/AWARDS

The Wilson County Urban-Type Facilities Board in Tennessee named **James Vaden** as stormwater director. Vaden served as the stormwater coordinator for the City of Lebanon for 16 years prior to joining Wilson County.

**Michael LaSala**, director of operations for LandStudies Inc. in Lititz, Pennsylvania, has been designated the state's first certified MS4 specialist (CMS4S).

Councilman **Jim Schmidt**, a member of the Jasper (Indiana) Stormwater Management Board, received the Sagamore of the Wabash Award. Lt. Gov. Sue Ellspermann was in attendance at his award ceremony and was quoted as saying about the award, "We honor people who are mentors, as leaders, as the great stewards of our communities and our state."

The **American Public Works Association** announced the following recipients of its 2015 Project of the Year awards:

- Environment (\$5 million to \$25 million): Port of Olympia (Washington) Stormwater Treatment System
- Disaster or Emergency Construction Repair (Small Cities/Rural Communities): San Ramon Canyon Storm Drain, managing agency is City of Rancho Palos Verdes, California

## LEARNING OPPORTUNITIES

### American Society of Agricultural and Biological Engineers

The ASABE is offering a Young Professional Development workshop

on April 8-9 in Lexington, Kentucky. Visit [www.asabe.org](http://www.asabe.org).

### American Society of Civil Engineers

The ASCE is offering:

- 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, Missouri

Visit [www.asce.org](http://www.asce.org).

### Wisconsin

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

## CALENDAR

### Feb. 14-17

American Society of Civil Engineers Geotechnical and Structural Engineering Congress 2016, Sheraton Phoenix Downtown Hotel, Phoenix, Arizona. Visit [www.asce.org](http://www.asce.org).

### March 10-12

National Utility Contractors Association Convention, El Conquistador Resort, Fajardo, Puerto Rico. Visit [www.nuca.com](http://www.nuca.com).

### April 25-27

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

### May 22-25

American Public Works Association North American Snow Conference, Connecticut Convention Center, Hartford, Connecticut. Visit [www.apwa.net](http://www.apwa.net).

### May 23-26

National Utility Contractors Association Annual Washington Summit, Embassy Suites Washington D.C. Convention Center, Washington, D.C. Visit [www.nuca.com](http://www.nuca.com).

### June 20-22

American Water Works Association Annual Conference and Exposition, McCormick Place, Chicago, Illinois. Visit [www.awwa.org](http://www.awwa.org).

### July 11-13

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

### Aug. 28-31

American Public Works Association International Public Works Congress and Exposition, Minneapolis Convention Center, Minneapolis, Minnesota. Visit [www.apwa.net](http://www.apwa.net).

### Sept. 12-14

National Rural Water Association WaterPro Conference, Orlando, Florida. Visit [www.nrwa.org](http://www.nrwa.org).

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

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