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August 2024

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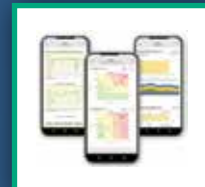
Coastal utility boosts transmission
system capacity to accommodate
growing population

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Christy Everett
Chief Executive Officer
Grand Strand Water &
Sewer Authority

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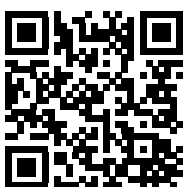
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SURVEYING AND MAPPING



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Grand Strand Water & Sewer Authority CEO Christy Everett has led the utility's efforts to improve capacity in order to support population growth in the coastal community.

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WATER & SEWER AUTHORITY



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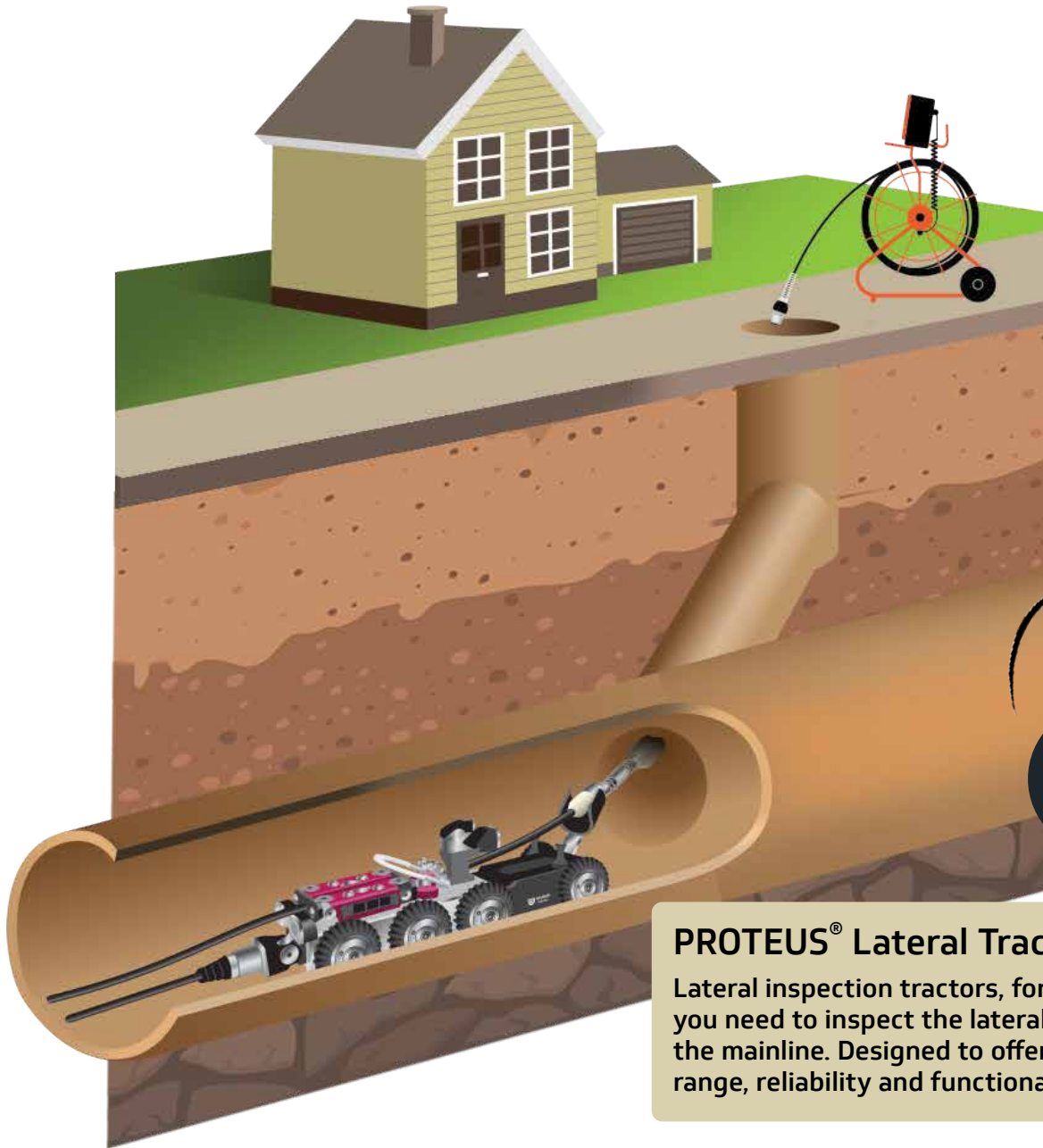
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EDITORIAL CORRESPONDENCE:

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Luke Laggis

SHIFTING YOUR APPROACH

There's plenty to learn from the improvements other utilities are making

I've probably never talked about our Case Studies section in this space. But I've talked about proactive system maintenance countless times.

It's easy to talk about shifting from reactive to a proactive operating mindset in a broad sense. That doesn't mean I can actually tell you how to do it. And to be fair, it's different — at least in part — for every utility. It depends what you've been reacting to, first and foremost.

No two systems are the same. They're as individual as the people who build, maintain and repair them. Naturally, there's no one-size-fits-all solution. You share many of the same challenges, but the specific problems in your system could be vastly different than the neighboring community.

When you're buried in your own problems, you might look at success stories of operational improvements and dismiss them as solutions or approaches that won't work for your utility, whether it's due to cost, conditions or any number of other factors. In many cases, that may be true because systems are individual. But it's that overall mindset that led to the solutions for those other utilities, and that's what it can do for you.

Gainesville Regional Utilities' sprawling collections system was suffering too many overflows because the traditional inspection schedule wasn't sufficient to

catch blockages before they caused problems. Rather than continuing to respond to overflows, they turned to a new assessment tool.

In Alexander City, Alabama, where overflows were also a problem, disorganized, inaccurate and incomplete data made it difficult to properly manage the collections system. In this case, a software solution transformed the city's approach to system management and gave a significant boost to proactive maintenance capabilities.

Payson, Arizona, had been using a variety of methods to track down and eliminate massive surges in wet-weather flows to its wastewater treatment plant. When the utility finally turned to a new sensor system, they were able to pinpoint the primary sources of infiltration and inflow within only a few rain events. A long-standing problem was quickly eliminated simply by turning to a new approach.

Funding is a challenge for every utility. But responding to emergencies as a regular order of business will always be more costly over the long run. In the three examples above, investing in a different approach led to overall savings. It might not be easy to make the shift, but it can pay off in ways that extend far beyond the bottom line.

This industry is filled with impressive technology. There are new methods, approaches, tools and equipment that can help transform the portions of your utilities that are stuck in reactive mode. I hope these case studies and the rest of the stories we share can provide some new perspective or bit of insight that might make a difference in your own utilities.

Enjoy this month's issue. ♦

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



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ARTIFICIAL INTELLIGENCE

Forecasting Algae Blooms

Los Alamos National Laboratory scientists are leveraging artificial intelligence to better forecast and understand harmful algal blooms. The AI models aim to consolidate dispersed data and provide insights into the complex ecosystems causing these blooms, aiding in the prediction and mitigation of their detrimental impacts. mswmag.com/featured



WHO'S THE CULPRIT?

Kids Pursue Water Wasters

California's West Basin Municipal Water District has created a fun and engaging online detective game to teach children how to conserve water at home. A part of the district's Water Star Student Conservation Program, the Water Star Detective game was launched in 2010. Read more about it in this online exclusive article. mswmag.com/featured

OVERHEARD ONLINE

"This marks the third straight year where national charges for wastewater collection and treatment services were outpaced by inflation."

—NACWA: 2023 Wastewater Service Costs Rose at Less Than the Inflation Rate
mswmag.com/featured



WATER INFRASTRUCTURE

EPA Report Reinforces Funding Need

Infrastructure Week 2024 recently served as a strong reminder that the need for continued investment in clean water infrastructure persists. The U.S. EPA also released its 2022 Clean Watershed Needs Survey Report to Congress, identifying \$630 billion in needed investment in the nation's clean water infrastructure. mswmag.com/featured



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“It’s a critical piece in our infrastructure that will provide enough water for residential and business growth.”

Christy Everett



PROFILE:

Grand Strand Water & Sewer Authority, Conway, South Carolina

POPULATION SERVED:

About 260,000 people

PRIMARY WATER SOURCES:

Bull Creek, Atlantic Intercoastal Waterway and an aquifer

WATER SERVICE AREA:

About 1,100 square miles

WATER CUSTOMER BASE:

Roughly 130,000 accounts

WATER INFRASTRUCTURE:

2 treatment plants, about 2,400 miles of water mains, 35 in-ground and elevated water tanks, around 10,720 fire hydrants

CAPACITY OF WATER TREATMENT PLANTS:

About 90 mgd

AVERAGE DAILY PRODUCTION:

53 mgd

WASTEWATER INFRASTRUCTURE:

15 wastewater treatment plants, around 1,200 miles of gravity and 1,100 of force sanitary sewer mains, about 29,318 manholes, 880 lift stations

SEWER ACCOUNTS:

About 120,000

WASTEWATER TREATMENT CAPACITY:

Roughly 85 mgd

AVERAGE DAILY TREATMENT:

About 41 mgd

EMPLOYEES:

About 385

WEBSITE:

gswsa.com



PHOTOS COURTESY OF GRAND STRAND WATER & SEWER AUTHORITY

RAMPING UP CAPACITY

Coastal utility boosts transmission system capacity to accommodate growing population

By **Ken Wysocky**

The coastal South Carolina region served by the Grand Strand Water & Sewer Authority is blessed with abundant sources of drinking water.

But getting that water where it needs to go can be a challenge, due to the region's expansive wetlands, swamps and waterways.

A good case in point is a recently installed, roughly 5-mile-long, 48-inch-diameter water transmission main needed to transport water from one of the utility's two surface water treatment plants to the city of Conway and two unincorporated communities in the southeastern portion of Horry County. The county is one of five in which the utility, based in Conway, provides water and sanitary sewer services in northeastern South Carolina and southeastern North Carolina.

The new line replaced a 36-inch-diameter line that was converted into a sanitary sewer force main.

"In order to keep up with growth and demand in the area, we had to improve capacity in the transmission system that carries water from our Bull Creek Surface Water Treatment Plant," says Christy Everett, the utility's chief executive officer. "To provide that additional capacity, we upsized from a 36-inch transmission line to a 48-inch transmission line that connects to the distribution systems in Conway and unincorporated Socastee and Carolina Forest.

"The additional capacity is a quite significant addition," she adds, noting that Horry County — which includes the cities of Myrtle Beach and North Myrtle Beach — is one of the fastest-growing counties in the United States.

"This is the largest-diameter transmission line in our system and this project was one of the largest infrastructure projects we've ever tackled," Everett says.

The project cost \$26.2 million and was funded by a low-interest loan from a state revolving fund that, in turn, was funded by the federal government.

Heading underground

To avoid contending with the Waccamaw River, which flows along the east side of Conway, about a half mile of the transmission line was installed via horizontal directional drilling. The pipe was made of spiral-welded steel from **AMERICAN SpiralWeld Pipe**, coated inside with polyurethane.

The boring was done by **Laney Directional Drilling Co.**, with the deepest section bored about 80 feet underground, Everett says.

A few other smaller sections of the pipeline — including one stretch that passes under a major state highway — also were installed by horizontal directional drill-

ing. The rest of the pipe was either installed underground or anchored to the bottom of swampland to keep it in place during periodic tidal flooding from the nearby Atlantic Intracoastal Waterway.

Tidal wetlands in the Waccamaw National Wildlife Refuge on both sides of the river posed a construction challenge. As such, the general contractor, Ruby-Collins Inc., had to build about one mile of "mat" access roads, following a route that was already cleared for overhead, high-voltage transmission lines.

One section of the road provided access to a large construction pad for the HDD equipment on the west side of the river and the other stretch led to another construction site on the east side of the river.



The Grand Strand Water & Sewer Authority's recently installed 48-inch-diameter water transmission main transports water from Bull Creek Surface Water Treatment Plant to the city of Conway and two other unincorporated communities.

WATER STORAGE-RECOVERY PROGRAM SAVES UTILITY MILLIONS OF DOLLARS

The Grand Strand Water and Sewer Authority in Conway, South Carolina, operates an innovative aquifer-storage program that's saving the utility millions of dollars by avoiding long-term infrastructure improvement costs.

The utility operates 20 aquifer-storage recovery wells that inject excess treated potable water from its Bull Creek Surface Water Treatment Plant into an aquifer during the off-peak season, which generally runs from September through May, says Christy Everett, the utility's chief executive officer.

Then during the months of June, July and August, when water demand peaks, the same wells pump the stored treated water into the utility's distribution system. The wells are strategically located in areas where peak demand is highest and water is pumped into the wells via about 2,400 miles of pipelines.

"As a result, this recovered water shaves off the peaks of water demand during the summer months," Everett says.

The amount of treated potable water that's injected and recovered varies according to demand. But on average, the wells inject up to 7 or 8 million gallons a day of treated water in the off-peak months, particularly in January and February. And during peak season, the utility recovers 7 to 8 mgd.

Doesn't the injected water mix with the existing aquifer water? Not really, Everett points out.

"Injecting the water creates a 'bubble' around the area where we inject, plus the water in the aquifer doesn't shift very much," she explains. "And we typically don't recover 100% of the water we inject, which leaves a buffer between the existing groundwater and the injected treated water."

The program started about 20 years ago and has saved the utility's rate payers "a lot of money," Everett says.

"It's expensive to invest in expanding a water treatment facility and then only use its full capacity during peak demand periods," she notes. "Yet we still have to be able to meet those peak demands."

"We are able to save our ratepayers millions of dollars by deferring water treatment plant expansions and by storing water in the aquifer, then recovering it during the peak-demand months."

"What passes through us goes into the ocean."

Christy Everett

Obstacles emerge

Work was halted at one point when heavy rains led to major flooding on both sides of the Waccamaw River, covering the construction pads with several feet of water.

"It took several days for the water to recede," Everett notes. "The project was delayed by a few weeks."

Pockets of pyrite rock, which is very hard, also slowed progress at times.

Because the HDD was performed in an uninhabited area, the contractor was able to weld together, lay out and test the entire section of pipe headed under the river before it was pulled into place from the east side of the river.

"We were very fortunate that most of the lay-down area was in wetlands and tributaries off the river, so it didn't impact any residents," Everett says.

The project was finished in spring 2022.

Tidal wetlands in the Waccamaw National Wildlife Refuge posed a construction challenge. General contractor Ruby-Collins Inc., had to build about a mile of "mat" access roads, following a route that was already cleared for overhead, high-voltage transmission lines.



Plentiful water sources

The utility gets most of its water from Bull Creek, an arm of the Great Pee Dee River, and the intercoastal waterway. The Bull Creek treatment plant supplies water for most of Horry County and the Myrtle Beach Surface Water Treatment Plant provides water for the cities of Myrtle Beach and North Myrtle Beach in the eastern part of the county, Everett says.

Each plant has a treatment capacity of 45 million gallons a day.

In addition, the utility operates 15 wells that pump water from an aquifer. The pumping capacity of the wells is about 15 mgd.

"We're located downstream of North Carolina's Great Pee Dee Watershed, so we're kind of the last user in the watershed, if you will, because what passes through us goes into the ocean," Everett explains. "So we certainly have an abundant source of water here in the coastal region of the Carolinas.

"We're also in a tropical storm area, so we often have tropical storms and hurricanes from June through October," she continues. "We get a lot of rain from those events, which keeps our water sources well-supplied."

Furthermore, the utility has built a network of nearly three dozen water storage tanks that store a total of 37 million gallons of water.

"The South Carolina Department of Health and Environmental Control requires us to keep a certain percentage of our water capacity in storage so that if a treatment plant goes down, we still would have water available," she explains.

Well-positioned for growth

Planning for the project began back in 2016, and the new water main well-positions the utility to handle the region's explosive growth.

"This pipeline should provide adequate capacity to other areas well into our 20-year comprehensive plan and beyond," she notes. "It's a critical piece in our infrastructure that will provide enough water for residential and business growth.

"Without it, we wouldn't be able to continue to provide quality service for water demand as well as for fire protection for residents and businesses."

More projects lie ahead. Along with a planned \$38.6 million expansion of the Bull Creek plant that will expand its capacity to 60 mgd, a 36-inch-diameter, approximately 9-mile-long water transmission main is in the design and permitting phase. The line will carry water to the northern part of Horry County and provide additional water capacity, operating flexibility and redundancy within the utility's water system.

"Keeping up with growth here is always a challenge," she says. "But we like to look at challenges as opportunities." ♦

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OH NO!! Someone's been wasting water! These 8 monsters were the only ones at the party today, SO ONE OF THEM MUST BE THE CULPRIT!



Select each suspect to see which type of cake they ate at the party, THEN CLICK NEXT TO EXPLORE THE CRIME SCENE FOR CLUES!



LEARNING HOW TO SAVE WATER

A water detectives game helps the West Basin Municipal Water District teach children how to be good water stewards

By Sandra Buettner

California's West Basin Municipal Water District has created a fun and engaging online detective game to teach children how to conserve water at home. A part of the district's Water Star Student Conservation Program, the Water Star Detective game was launched in 2010. It is an extension of a water recycling facility school tour program started in 1996.

The district's world class Edward C. Littles Water Recycling Facility provides recycled water to commercial and industrial customers throughout its service area in Los Angeles County. Located in El Segundo, California, the facility produces 30-40 mgd.

Game on

Every year, 3,000 to 5,000 students in grades 3-12 take part in the tour and program. The detective game is an entertaining part of the experience and augments the event.

It was created in 2010 by district staff members Alexis Tate, public information officer; Ron Wildermuth, communications manager; and Noelle Collins and Darryl Ramos-Young, public information specialists, with help from a consultant.

The program and the game were promoted directly to educators and through Facebook and Instagram. The online game begins with a sea star mascot (Water Star Detective) who represents the living organisms in the watershed. After that,

“They learn to conserve water and how they can educate family members on using water more responsibly.”

Janel Ancayan

eight monster characters pop up on screen to music inspired by the *Law and Order* television show theme.

The monsters represent bad behaviors that waste water. Through a series of clues, students decide which monster is the culprit. Bad behaviors include long showers, leaky faucets, dishwashers and laundry machines with less than full loads and hosing off driveways instead of sweeping. To encourage students to play repeatedly, the culprit clues change every time.

“The Water Star Detectives game is the first spark of learning for the kids on how to save water and preserve life in the watershed,” says Janel Ancayan, public information specialist.

“Through the game and the program, children learn how to recognize bad water behaviors at home and how to correct them. They learn to conserve water and how they can educate family members on using water more responsibly.”

After taking the tour and playing the game, the kids receive a kit of items that they can use at home to help in their water-saving mission. The kit includes:

- A five-minute timer for showers
- Toilet tank bank, a device that saves 0.8 gallons per flush
- Toilet detection tablets: a blue dye in the toilet bowl that indicates a water leak
- An activity booklet that teaches about the water cycle
- Paper Fix It tickets that kids can issue to family members who waste water

Measures and metrics

The game and program have been popular with educators and the students. Since 2010, more than 50,000 students and hundreds of teachers have taken part. With the take-home kit and the knowledge they gain about conservation, kids can educate family members, extending the district’s reach. The water savings from using the learning tools and information the kids are taught, average 20 gallons per person, per day, says Ancayan.



Students register on the district’s website that they are implementing family conservation measures and are entered in raffles for prizes that include bacteria plush dolls, also featured during facility tours.

In 2022 alone, through the efforts of children and families, the district estimated savings of more than 500,000 gallons.

Comprehensive education

The district has programs other than the Water Star Student Conservation Program that encourage students to conserve water. Staff members speak in classrooms and take part in school assemblies. A student art contest focusing on water conservation.

The district partners with schools to promote water careers, and staff members take part in school science, technology, engineering, art and mathematics (STEAM) programs and fairs. In addition, the district has a program in which students collect coastal water samples and work with staff to gain lab experience. The students analyze the samples for bacteria levels, and the data is published to encourage advocacy for watershed protection programs.

Ancayan was working at a school STEAM fair when a student came up to her and told how much he loved the tour and how much he learned. She concludes, “We encourage all the students to consider a career in environmental science studies.” ♦

The district’s education program includes a water recycling facility school tour program that originated in 1996.





RESPECT YOUR HAND AND POWER TOOLS

Taking responsibilities seriously can help eliminate common injuries

By Ronnie Freeman

Humans are unique in that we can develop tools to help us do our jobs easier, faster and safer. Manufacturers have been developing newer ways of making our hand and power tools safer so that we can get the job done and get home safe.

Still, every year over 400,000 employees are sent to emergency rooms across the country with injuries caused by hand and power tools. Why is this? Are the tools not that safe, or is it more a case of human error? Lots of human errors?

Since it's estimated that unsafe acts cause up to 90% of incidents, we can mostly eliminate the tools as being the cause except in cases where unsafe tools become a contributing factor. It's an unsafe act, however, to use an unsafe tool, so back to the human error cause.

Typical hand and power tool injuries usually do not cause death, but it does happen. Consider this: Almost 200 people die each year due to incidents involving hand and power tools. Hand and power tools are the number one cause of

nonfatal injuries in the workplace. Most injuries can range from minor cuts and punctures to broken bones, burns, shock and amputations. The common causes of most of these injuries are things like the misuse of a tool, using an unsafe tool, horseplay, removing safeguards, accidentally touching the moving components, using the wrong tool, or using the right tool incorrectly.

Failure to wear the appropriate personal protective equipment can be a contributing factor in many injuries as well. When new tools are purchased, they will come with manufacturer's instructions that include safety information. Failing to read and adhere to these instructions can also be a contributing factor in many of these injuries.

What are an employee's responsibilities when it comes to working with hand and power tools? Here's a simple list that can be helpful in eliminating these types of injuries.

Read the manufacturer's instructions before using the tool, especially if you

Using a tool in need of repair is asking for an injury.

have not handled this type of tool before. Understand the safety aspects of the tool and follow the guidelines.

Keep all tools in good condition. Have a regularly scheduled maintenance program for your tools. This is an important part of hand and power tool safety. Using a tool in need of repair is asking for an injury.

Always use the right tool for the job. If you are unsure, ask your supervisor. Do not use a screwdriver for a chisel or a wrench as a hammer. These types of actions can damage the tool, cause failure of the tool and potentially lead to injury.

Never use a tool if you have not been properly trained on its use. Just because you are familiar with one type of saw does not mean you are ready to use a different type of saw. Never be afraid to ask for instructions.

Inspect each tool before using. This is an important part of being safe with tools. A quick inspection can reveal any deflections or damage that can contribute to an injury. If you find an issue, take the time to repair the tool or replace it with a properly working tool.

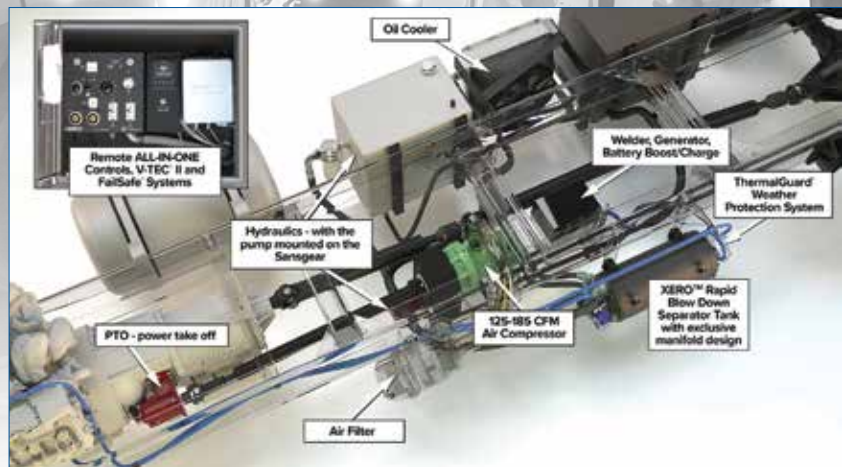
Use the right PPE. Having the appropriate PPE can help protect you from things like flying particles and debris, sharp edges, noise, and other hazards that tools produce. The manufacturer's instructions will guide you to the right PPE if there are questions.

Use common sense! If it looks unsafe, then it is unsafe. Think through the task at hand and make sure you are completely safe. This is for your own protection and peace of mind.

The bottom line is, hand and power tools are designed to help us get the job done so let's use them in a safe manner. Let's make sure we go home every day with all our fingers and toes. No employee wants to get injured. It's simply not worth it. Following these seven simple guidelines you will stay on the job and out of the emergency room. ♦



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FOCUSED ON ADVOCACY

NASSCO is taking significant steps to better advocate for the underground infrastructure industry.

By Sheila Joy

In the last two issues of this publication, I shared NASSCO's 2023 accomplishments in working toward strategic goal No. 1, growing NASSCO's training and education programs, and goal No. 2, expanding NASSCO's library of technical resources. This month we will review strides made to accomplish our third goal: Advocate for the underground infrastructure industry.

As a 501(c)(6) trade association, NASSCO's most obvious advocacy surrounds government relations and the work our members do to help educate elected officials on the need to fund the assessment, maintenance and repair of underground infrastructure. Specifically, we recommend:

- Include in the fiscal year 2025 budget full funding for the water infrastructure funding programs included in the Infrastructure Investment & Jobs Act as well as all other federal programs that fund water infrastructure
- Provide full funding annually to federal programs and offices that directly and indirectly ensure that the Clean Water Act and National Pollution Discharge Elimination System permits remain in full regulatory compliance
- Provide federal technical and grant assistance to communities that lack the financial and technical resources to develop comprehensive asset management plans
- Require that asset management plans be in place for sanitary and/or storm sewer systems for all applications to federally subsidized grants and loans

After several years of communicating these key recommendations, NASSCO is making a mark in Washington, D.C. through our government relations consultant, Steve Dye, who works tirelessly to ensure that our voice is heard. We have also gained excellent traction thanks to the annual NASSCO Washington, D.C. Fly-In events when our members travel from across the country to join us in the Nation's capital to meet with their elected officials. With our growing membership in Canada, we have recently engaged the services of a government relations specialist in Ottawa to help us advocate for proper asset management and funding of water and sewer systems across the border.

Less obvious advocacy efforts include protecting our workers and communities from health and safety risks. Over the past six years, NASSCO has worked with institutions of higher learning to better understand the health and safety risks, if any, from styrene emissions used in the cured-in-place process. The findings from these studies have provided specific recommendations to be followed on the job site. The NASSCO website contains a plethora of information on the topic, including the research findings and recommendations, as well as videos, webinars, specification guidelines and so much more. Please visit nassco.org/safety to learn more, download and share this valuable information.

NASSCO believes there is still more to learn about styrene safety, and it is therefore funding a Phase 4 Study in partnership with Dr. Tom Iseley and his team at BAMI-I. This research initiative focuses on establishing the styrene discharge concentration in cure water that may create bioinhibition at publicly owned treatment plants. With a goal of completing this by the end of 2024, the study began with Dr. Iseley and his team conducting a thorough literature review of peer reviewed research and a survey amongst POTWs to determine current perceptions on the subject. The final phase of the study, yet to be awarded, will include laboratory testing and development of a white paper on the findings. The goal of the study is to establish laboratory inhibition standards and refine recommendations included in NASSCO's guideline titled "The Safe Use and Handling of Styrenated Resins in the CIPP Process."

To download NASSCO resources, learn more about membership, watch prerecorded webinars, and so much more, please visit nassco.org. ♦

NASSCO is making a mark in Washington, D.C.



NASSCO is located at 5285 Westview Drive, Suite #202, Frederick, MD 21703; 410-442-7473; www.nassco.org

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

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Orange County Sanitation District team members work on grouting joints in one of two aging sewer trunk lines where inflow and infiltration had been a problem. PHOTOGRAPHY BY ED CARREON AND THE ORANGE COUNTY SANITATION DISTRICT

GROUTING AGAINST I&I

Orange County takes a joint-specific approach to reducing inflow and infiltration

By *Giles Lambertson*

Why line an entire sewer pipe when grouting the pipe’s joints will stop the inflow and infiltration? That was the question Orange County (California) Sanitation District Senior Engineer Dickie Fernández first asked himself and then the utility’s engineering managers.

“The pipe segments were in great shape. I saw minimal cracking,” Fernández says about his engineering condition assessment of two sewer trunk lines and a sewer interceptor pipeline targeted for repair in OC San’s 380 miles of sewer main. “I proposed that if we just performed chemical grout injection on leaking joints, we would control the existing inflow and infiltration and could extend the life of the pipe another 50 years. They agreed.”

That was in 2019. After work actually began on the rehab project in 2021, the decision to rely on chemical grout for the bulk of the repair work looked better and better. While there were some unexpected outcomes — mostly stemming from the variety of pipe in the rehabilitated sections — the bottom line was a \$3 million savings in the cost of the project.

Alternative solution

OC San is a public agency that provides wastewater collection, treatment and recycling services for approximately 2.6 million people in central and northwest Orange County. OC San is a special district governed by a 25-member board of directors composed of 20 cities, four special districts and one representative from the Orange County Board of Supervisors. OC San has two operating facilities that treat wastewater from residential, commercial and industrial sources, treating approximately 180 mgd of influent. In cooperation with the Orange County Water District, OC San provides secondary treated effluent to OCWD for advanced filtration and production of 130 mgd of potable water, the largest operation of its kind in the world.

OC San has moved in recent years from an emphasis on expansion and building out of the system to rehabilitation and maintenance, according to Andrew Brown, OC San’s engineering supervisor. “Now the core assets are in place and we just need to keep them running,” he says, adding that a more systematic inspection program has been implemented. “Some of the lines are nearing the end of their use-

ful life, so we’re ramping up rehab and replacement. About 80% of our capital improvements budget next year will be for that.”

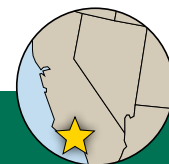
Much of the collections system is more than 50 years old, Brown says. In the three rehabbed pipelines — two trunk sewers and one interceptor sewer — two of the lines date from 1959, another from 1976. After an initial assessment of the segments in 2018, the decision was made to rehabilitate the pipelines using a cured-in-place technology.

That would have involved lining 40,000 feet of vitrified clay pipe, which ranged from 21 inches to 39 inches in diameter. Another 600 feet of pipe was in such poor condition that it needed to be replaced entirely. In addition, about a hundred manholes would be repaired or replaced.

Then, Fernández offered his alternative solution

“Some of the lines are nearing the end of their useful life, so we’re ramping up rehab and replacement.”

Andrew Brown



PROFILE:
Orange County, CA
Sanitation District

ESTABLISHED:
1998

SERVICE AREA:
479 square miles in central and northwestern Orange County

PEOPLE SERVED:
2.6 million

INFRASTRUCTURE:
388 miles of sewer line, 15 pump stations, and two 100-acre reclamation facilities

WEBSITE:
www.ocsan.gov

The main office of the Orange County Sanitation District in Fountain Valley, California.





CONSULTING WITH OTHER UTILITIES

The trunk and interceptor pipelines of Orange County Sanitation District are well situated for longevity. For one thing, they are laid deeper in the ground than most sewer lines.

OC San is a regional wastewater authority that serves a total of 25 member agencies; 20 cities, four special districts and unincorporated areas of Orange County. Each member agency has its own sewer collections system, which discharge into OC San's trunk and interceptor sewer pipelines and convey the flow to either its Plant 1 or Plant 2 wastewater treatment facilities. As a result, OC San's pipelines are deeper than those of its member agencies and consequently closer to or beneath the groundwater table. Generally, OC San's pipelines are 15 to 20 feet underground.

As for the impact of Orange County soils on pipe, that is of less concern to OC San's Senior Engineer Dickie Fernández. The soils mostly are clay, loam and sand, types of earth materials that pose little threat to the vitreous clay in the OC San system. Furthermore, because the pipe often is buried beneath a public right of way, tree roots are rarely a threat, Fernández says.

What sometimes is found deeper underground, however, is water, and that is more problematic.

When OC San opted to stem inflow and infiltration into some of its lines by grouting the joints, Fernández "put in a lot of research" to determine if that was a realistic solution. He consulted with peers in Miami, Florida, and San Francisco, where grout is more frequently employed to cure leaking pipe. After all, the water table in Miami is notably high. Pipe material, type of pipe joints, soils and groundwater table are other variables that Fernández considered in his engineering recommendations.

"Based on my conversations with Miami and San Francisco, I felt chemical grout was a great option given the right circumstances. Chemical grout injection is now another tool OC San can use in future projects."

and the project headed in a different direction. "Cured-in-place pipe lining is a great product and I'm a great fan of it," the senior engineer says, "but given the pipeline's great structural condition, I did not see a need for CIPP, but a need to stop inflow and infiltration."

OC San engineers were familiar with chemical grouting, though not as the grout would be used on this project. Grout can also be employed in conjunction with cured-in-place projects when there's a need to seal off areas of a pipe experiencing active infiltration, which would jeopardize curing of the CIPP liner.

Wholesale chemical grouting of joints using a sophisticated remote-controlled packer was something new for OC San. It scouted around for contractors who are experienced with the technology in the immediate Orange County area and in the San Francisco Bay Area. The project eventually was awarded to Steve P. Rados Inc. as the prime contractor. Performance Pipeline Technologies (sub-contractor) ended up performing both the grouting and the approximately 3,000 feet of CIPP installation.

The project began by putting each joint under 10 psi of air pressure, with the requirement that the joint sustain the pressure for at least 30 seconds. "If the joint passed, it received no grout. If it failed, we injected grout and retested," Fernández says of the process.

If a joint failed to hold pressure after being grouted, more grout was injected until it passed the air pressure test. Overall, the 1959 pipe had far more joints failing the air pressure test — 2,043 to the newer pipe's 336.

Defying expectations

Surprises experienced in the course of the project began almost immediately. When Performance Pipeline Technologies started cleaning the pipe and removing the calcium deposits prior to injecting grout, it didn't go as planned. The contract stipulated "the work shall be performed through the use of a CCTV-operated robotic system capable of traversing up to 600 linear feet and removing the obstruction through the use of a high-pressure water stream."

The specifications also stated, "The use of lumberjacks, chain knockers, rotary cutters or mechanically driven systems are not acceptable." However, this restriction was later relaxed and the subcontractor employed a combination of a CCTV-operated water stream and mechanical cleaning methods, mainly a robotic cutter.

Another surprise: Fernández presumed more chemical grout would be injected into joints of the 1959 sewer pipe than into joints of the newer pipe. That seemed logical. After all, the National Clay Pipe Institute had informed him that joints in the older pipe probably employed field-applied oakum rope seals, whereas the 1976 pipe had more effective factory-installed polyurethane seals.

"I naturally assumed the older pipe would require more grout per joint," he says. "What I found was completely the opposite."

As measured by the amount of grout injected into failed joints per inch of pipe diameter, the results defied expectations. The 1959 pipe joints required an average of 5.8 gallons of grout. The failed joints in the newer pipe needed an average 9.5 gallons of grout — about 80% more! However, as expected, the 1959 installation had significantly more failing joints; approximately 60% of them failed while the rate of failing joints in the 1976 installation was approximately 10%.

How could that be? Calcium. When the older pipe joints failed dramatically, calcium deposits clogged the joints and protruded into the interior of the pipe. Though precleaning of the pipe had removed the visible buildup of calcium inside the pipe, the jetting or robotic cutting did not extend into the joints themselves. Consequently, the same calcium that announced failure of a joint also partly filled the joints and became part of the sealing solution.



“I naturally assumed the older pipe would require more grout per joint.”

Dickie Fernández

“We needed to inject less grout into the cracks to seal them because the calcium already was there,” Fernández says. The reverse was true in the newer pipe: There, the absence of calcium buildup meant that some failed joints required quite a lot more grout. In fact, 28 of those joints each needed 20 gallons or more to seal. Seven of them required 40 gallons or more.

Though that surprised the engineers, the bottom line for the project did not disappoint anyone. With all the variables included, approximately 15,000 gallons of chemical grout were injected into the joints to make them whole again.

By project’s end, instead of spending \$7 million to line the sewer pipe, OC San expended about \$4 million for grouting.

Working upstream

OC San is continuing its rehab and repair of sewer infrastructure this year. It’s working on upstream portions of the same trunk and interceptor sewers grouted previously. Chemical grout again will be employed and Fernández and other OC San engineers are hunching over computers and calculators attempting to come up with good numbers to guide them.

“It is difficult to estimate the volume of grout,” Fernández says, which at this point seems like an understatement. “We don’t know how many joints will fail, but the presence of calcium deposits or visible infiltration confirms the joint is not sealed. We don’t know the condition of the trench hosting or the potential voids in it. We’re flying in the dark a little bit.”

If the next “flight” is anything like the last one, the betting is it will be a smooth and successful one, if not totally unsurprising. ♦

FOCUS ON THE JOINTS

Orange County Sanitation District experienced success when, beginning in 2021, it rehabbed some 40,000 feet of trunk and interceptor sewer pipe by grouting joints in the pipeline. Success was measured three ways — in dollars and cents (opting to grout the joints instead of lining the pipe saved \$3 million), minimized traffic impact (the work was performed at night with temporary traffic control) and reduced aggravation (the contractor did not have to reroute wastewater flow to avoid work areas).

Given all that, one might conclude that grout is now the go-to solution for failing infrastructure. Unfortunately, the chemical grouting process cannot heal every ailing pipeline.

“You need to have a pipe that is in pretty good shape,” says Dickie Fernández, OC San senior district engineer and a proponent of grouting. “If joints are leaking, grout can fix that. But if the pipe shows a lot of cracks and fractures, this is not going to be a good solution.”

The reason is air. The chemical grout is injected into the narrow space where the ends of pipes meet in a manufactured joint. The integrity of the new grout seal is tested by putting the joint under 10 psi of air pressure and measuring any loss over 30 seconds. If there is none, the joint is sealed.

However, the remotely operated injection and air-testing equipment functions within a short span of the pipe, just enough distance to fully incorporate a joint. Therefore, a crack running length-wise along a pipe cannot be contained for air testing.

“The air testing can only be done at the joints,” Fernández says. “If you have fractures running the length of the pipe, it is not worth testing it because it will fail the air pressure test.” And without being tested, it is unknown whether a grouted joint has been made whole. Such speculative results are not highly valued.

Under such conditions, cured-in-place pipe lining (for maintaining the same diameter) or pipe bursting (to increase the diameter) solutions are appealing.

The city of Winter Haven eventually will be encircled by a roughly 30-mile-long underground transmission pipeline for reclaimed water that will help restore roughly 19 wetland areas, providing a bounty of recreational opportunities and enhancing wildlife habitat for the Central Florida city.

The wetlands — about 5,000 acres in all — will become part of a project known as the Sapphire Necklace, a connected chain of natural jewels: parks, lakes and green spaces. They’ll be connected by an approximately 40-mile, multimodal trail system. The 12-foot-wide trail eventually will connect with a statewide trail system, says Gary Hubbard, director of the city’s water department.

But the wetlands, which historically have been ditched and drained, will serve another purpose, too: help recharge the Upper Floridan Aquifer from which the city pumps its water.

The Sapphire Necklace will include about 20 lakes within nature parks. (Winter Haven is known as the “Chain of Lakes City” because 50 lakes of varying sizes lie either within or border on the city limits.)

The wetlands will be filled by reuse water from a new, \$420 million wastewater treatment plant expected to be built by 2028. The plant will be capable of treating 12 million gallons of sewage per day, Hubbard says.

The restored wetlands will also help fill local lakes, which are well below their predevelopment levels, according to the Southwest Florida Water Management District.

The transmission ring, which will consist of 20-inch-diameter PVC and HDPE pipe, will be completed in around five years. It will connect to both wastewater treatment plants and allow the city’s water utility to transfer reclaimed water anywhere it’s needed around the city.

The western half of the loop is already completed — a 22,850-foot-long, 24-inch-diameter reclaimed waterline completed in 2022. The rest of the transmission ring is being built as development occurs; developers are required to partially pay for these various segments, he says.

“We don’t want to arbitrarily install the transmission ring and then have to move it to accommodate the best route through properties,” Hubbard adds. “So we’ll do it in conjunction with development.”

Excess water from the wetlands will be used to recharge the aquifer through a combination of injection wells and rapid-infiltration basins, Hubbard says.

“Over a 50-year period, those wetlands could store 83 billion gallons of water,” he says. “Projects such as this are part of a bigger plan to restore, recharge, reclaim and reuse water resources in Winter Haven to the fullest extent.”

CASE STUDIES

PIPELINE INSPECTION, SURVEYING AND MAPPING

By Craig Mandli

Assessment tool helps utility fulfill maintenance plan

Problem:

Gainesville Regional Utilities maintains a 671-mile collections system that serves 67,000 customer connections around the city of Gainesville, Florida. As a result of their aging collections system with pipes exceeding 100 years in service, and inspection frequencies averaging 19 years, the utility encountered frequent sanitary sewer overflows and blockages. Traditional inspection methods proved too slow and costly for a system of their size, forcing them to rely heavily on reactive maintenance.



Solution:

In October 2022, the utility established the System Wide Assessment & Maintenance Plan to transition from a reactive to a proactive, condition-based maintenance approach. A key component of SWAMP is the implementation of the Sewer Line Rapid Assessment Tool from InfoSense. The SL-RAT uses transmissive acoustics to give the high-level blockage conditions of a pipe segment in approximately 90 seconds. This efficient approach enables the utility's two-person crew to evaluate upwards of 10,000 feet of gravity sewer lines daily, allowing for swift identification and resolution of problematic pipes.

RESULT:

The SWAMP program delivered notable efficiency and performance improvements. The utility has inspected over 390 miles using the SL-RAT, reducing inspection frequency to 2.5 years. Targeted cleaning of 17% of the system led to a 64% reduction in SSO discharge volume in 2023.

877-747-3245; www.infosense.com

Sensors help utility locate inflow and infiltration

Problem:

Each year, monsoons hit Payson, Arizona, and within 24 hours, Green Valley Water dealt with water entering the collections system and pouring into the treatment facility at a rate nearly double the normal daily inflow. Smoke testing, CCTV, flowmeters and other isolation techniques had proven ineffective.



Solution:

In 2023, Green Valley Water incorporated a service from RH Borden called iTrackers. They are sensors that can be deployed in a network and monitor water levels at all times. When rain comes, these sensors work together and can pinpoint exactly where the I&I is coming from. RH Borden deploys iTracking either across full collections systems to assess all major basins or in a targeted way on a single basin.

RESULT:

After only two to three rain events, RH Borden identified the top two basins in the system contributing to I&I and also the top five manholes in those basins where the I&I was entering. With this pinpoint accuracy, Green Valley now knows where to make the necessary repairs to stop the I&I from entering. 385-228-5350; www.rhborden.com

Software assists city's management of sewer system

Problem:

Alexander City, Alabama, faced significant challenges in managing its sprawling 150-mile sewer network efficiently. The city's old approach relied on manual memory for sewer line locations, and early attempts to use camera inspections lacked supportive software, resulting in disorganized and error-prone inspection data. This inefficiency hindered effective sewer management, and the city often experienced up to 100 overflows annually due to inconsistent maintenance and oversight.



Solution:

To address these issues, the city adopted ITpipes, a comprehensive software solution that integrated seamlessly with ArcGIS mapping tools. ITpipes provided easy-to-use interfaces for pipe inspection and robust data management capabilities, which transformed the city's approach to sewer system management. The implementation of ITpipes Mobile, Web and Sync allowed field crews to access real-time data, automatically fill in asset information during inspections, and sync inspection data back to the office without data loss. This integration of GIS with asset data facilitated a more structured and efficient inspection process.

RESULT:

The adoption of ITpipes significantly improved the management of the city's sanitary sewer system, reducing the number of annual overflows from 100 to single digits, demonstrating a drastic enhancement in proactive maintenance capabilities. Routine inspections became more systematic, allowing the entire sewer network to be comprehensively inspected every two years. The software not only streamlined data handling and inspection processes, but also supported the city's staff with training and operational ease, leading to more effective prioritization of sewer lining projects and better overall infrastructure management. 877-487-4737; www.itpipes.com ♦



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The **ForeSITE FS-UL** ultrasonic level system from **ADS Environmental** is a solution for flood-prone site monitoring. The low-cost system includes all hardware and software necessary for continuous monitoring of vulnerable locations with two user-defined alarm levels. Moreover, it elevates communication reliability with its redundant cellular communication. The system automatically accesses one of two providers, selecting the most efficient connection, assuring communication continues during critical events. It requires very low maintenance, and its long-life battery enables up to four years of operation. Its compact 3.5-inch height by 4.9-inch diameter provides inconspicuous mounting in remote locations. It is also used for monitoring in stormwater vaults and outfalls, rivers, streams, lakes, reservoirs and canals. **877-237-9585; www.adsenv.com**



Vivax-Metrotech vLoc3 RTK-Pro

The **vLoc3 RTK-Pro** utility locator from **Vivax-Metrotech** adds RTK GNSS accuracy. Using the internal cellular module with 4G LTE capabilities, the operator can connect to an NTRIP RTK (Real-Time Kinematic) caster that provides RTCM 3 corrections. By utilizing these corrections, the operator can collect both utility location data and the utility's geographical location with survey-grade accuracy. All field data is sent to the cloud and retained in the receiver's onboard storage for review and exporting to mapping programs. The user-configurable receiver contains eight passive locate modes, fault find mode, Signal Direction, and a range of frequencies from 98 Hz to 200 kHz. Users can also configure visual and mechanical vibration alerts for shallow depth, overload, overhead cables and excessive swinging. **800-446-3392; www.vxmt.com**



Mainline TV Camera Systems

Aries Voyager

Aries has added flexibility and efficiency to its **Voyager** mainline inspection system with the introduction of a completely mobile version. The unit easily navigates pipe conditions to capture detailed, high-definition video of relined mainlines 6 to 48 inches and up. The compact, portable system, equipped with an 800-foot cable, can easily be carried in a pickup truck (fits under a tonneau cover) or mounted in a truck, van, trailer or Aries TrailBlazer. The **Mobile Voyager HD System** is digital CANbus enabled for instantaneous camera and tractor response. Inspections are viewed on a 15-inch daylight readable touchscreen with thumbstick controls. An in-the-pipe **Wiper-Cam** lens cleaning system maximizes inspection time versus downtime. A compact, full-HD 1080p pan-and-tilt video camera, with 120x zoom, captures every pipe detail around the crawler. Optional dual camera lasers are available to precisely measure cracks. **800-234-7205; www.ariesindustries.com**



Electric Eel EELvision Elite

The **EELvision Elite** inspection camera from **Electric Eel** is ideal for inspecting 3- to 10-inch-diameter lines. It has a 1.30-inch self-leveling color camera with vivid adjustable LED lights and a large 7-inch monitor for easy viewing. A sunshield allows for outdoor viewing and protects the monitor in transport. It comes standard with 200 feet of 1/2-inch-diameter premium pushrod, an on-screen footage counter, continuous-display odometer, one-touch recording to a USB and screenshot capability, an extended ergonomic handle to facilitate maneuverability and transport, a heavy-duty metal frame and wheels, a user-friendly control panel, quick start guide tutorial prompts, QR code for manual and support accessibility, a built-in always-on sonde, dual power sources (AC and battery) and a Makita battery port (it also accepts both Milwaukee and DeWalt batteries with a provided adapter). **800-833-1212; www.electriceel.com**



Envirosight Verisight Ultra

The **Verisight Ultra** from **Envirosight** simplifies workflows while delivering exceptional image quality. It includes a 1080p full HD touchscreen monitor, which records hi-def video and photos to enable quick and accurate identification of blockages, defects and other issues that may compromise the functionality and safety of underground pipelines. Self-leveling pan-and-tilt advanced camera control options are available. It also has a compact and lightweight design for easy maneuverability through tight spaces and uneven terrain. The system offers the ability to perform inspections standing up or on its side for added versatility on uneven ground. It offers the choice of 200 or 330 feet of "built for distance" cables. **866-936-8476; www.envirosight.com**



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EPL Solutions Gvision V7

The **Gvision V7** from **EPL Solutions** is a ruggedized elite camera system that can be purchased for mainline use with 200, 300 or 400 feet of stiff yet flexible pushrod or a 150-foot mini-camera. Instantly capture video recordings and snapshots with the press of a button and access them anytime within the internal storage. The technician will never have to wonder where a video was taken as geolocation information is automatically attached and displayed on recordings. Add text overlay using the camera reel or a USB keyboard. Copy recordings and snapshots on two USB flash drives at once, or share them using the Gvision app. The app allows the user to remotely control, preview and download video inspections for easy sharing. Users can capture every detail with the color camera head clearly displayed on a 10.4-inch TruView LCD. Add an internal battery for up to six hours of runtime. **714-453-9760; www.epls-usa.com**



Fiberscope.net by MEDIT VIPER PT

The **VIPER PT** pipe camera from **Fiberscope.net by MEDIT** offers a fully portable, all-in-one design making it easy to transport and set up, allowing users to get to work quickly and without any hassle. The miniature pan-and-tilt camera head measures only 1.1 inch in diameter, providing a comprehensive view of the interior of the pipe. The camera features an HD video sensor, which delivers crystal-clear footage. The system comes with a 98-foot insertion push cable with a pre-attached 512 Hz sonde, making it easy to locate and track the camera head as it moves through the pipe. The control unit features a high-resolution, daylight-readable display. Captured data allows users to refer back to the footage at a later time. Adding text notes also makes it easy to keep track of important details and observations during the inspection. **877-613-2210; www.fiberscope.net**



General Pipe Cleaners Gen-Eye X-POD Plus

The **Gen-Eye X-POD Plus** sewer camera system from **General Pipe Cleaners** includes the Gen-Pack battery adapter, Wi-Fi transmitter and an on-screen distance counter as standard equipment. The battery adapter lets you operate the camera system for up to 12 hours in remote locations with limited access to power. Fuse-protected to safeguard your equipment investment, the battery adapter is also available separately. A battery and charger are not included. The built-in Wi-Fi transmitter lets you view and record inspections on a cellphone. Using the system's USB port, you can also archive activity on handy flash drives. The on-screen distance counter shows how far the camera has traveled down a line in feet or meters. Settings can be adjusted for full-size or mini-reel configurations. **800-245-6200; www.drainbrain.com**



Hathorn H7

The **Hathorn H7** system comes standard with a 7-inch daylight-readable, shatter-resistant LCD monitor with 1,000 candelas per square meter of brightness. It also has an onboard hard drive with 64 Gb (upgradable to 128 Gb) capacity and USB recording allowing the user to record MPEG4 video and JPEG screenshots. These systems are compatible with 18-volt Milwaukee (or equivalent) batteries for ultimate portability and over 5 hours of runtime on a single charge. All units come equipped with 200 feet of



premium cable and a choice of self-leveling camera heads. Optional Wi-Fi video streaming technology is available. **866-428-4676; www.hathorncorp.com**

MyTana MS11-NG2

MyTana's versatile **MS11-NG2** inspection system inspects 3- to 6-inch lines with a self-leveling camera head. Swap in a smaller head included with the optional MS11+ Combo Kit to inspect 1.5- to 2-inch lines. Each head has a 512 Hz transmitter built in. A high-clarity 6.4-inch daylight-readable monitor and all the controls are integrated on the sturdy reel frame for grab-and-go convenience; helpful when access points are scattered or hard to reach. Save footage to internal or removable drives, or stream video wirelessly to a mobile device and add voiceover using the built-in microphone. The durable pushrod is available in 150- or 200-foot lengths and can be replaced in your facility. **800-328-8170; www.mytana.com**



Spartan Tool Traveler 3.0

The **Traveler 3.0** is the next generation of **Spartan Tool's** all-in-one sewer inspection system, upgraded for tough customers. It is the same compact, portable size as before but includes completely rebuilt and upgraded interior components. It offers a stronger, more durable pushrod with a removable reel, allowing you to swap reels in the field quickly and easily. An upgraded camera head with high-intensity LEDs comes standard, but a line of easily interchangeable, customizable camera heads is offered for flexibility. The upgraded interior electronic components are built to withstand harsh environments and deliver better resolution and accuracy. **800-435-3866; www.spartantool.com**



Subsite Electronics Push Camera

When a transporter isn't an option because of pipe size or limited access, the **Subsite Electronics Push Camera** allows operators to complete inspections in the most challenging conditions. Ideal for pipes from 1.5 to 12 inches, it features single conductor technology with a rigid 1/4-inch fiber pushrod covered with a durable Hytrel jacketing that allows operators to inspect up to 500 feet down the line. Additionally, the 1/4-inch-diameter single conductor cable provides added strength without weight concerns, allowing operators to complete significantly longer inspections without the cable getting twisted or warped. The 1545 camera with an in-line 512 Hz beacon allows the operator to easily locate damage and blockage in the pipe. The camera is controlled by a 1575 controller, which features a rugged, durable and reliable enclosure. **800-846-2713; www.subsite.com**



Trojan Worldwide VIS-130HDPT

The **VIS-130HDPT** all-in-one camera system from **Trojan Worldwide** includes a small pan-and-tilt 1080P high-definition camera head measuring 1 inch in diameter. The unit is encased with a 10.1-inch LCD, DVR recorder, controls for the camera head and a keyboard for text writing. With the included Wi-Fi capability, the user will have the ability to record audio and video directly to any Android phone or tablet, making this a versatile, compact camera. **800-392-4902; www.trojanworldwide.com**



Mapping

MentorAPM MapViews

Utilities typically have a backlog of weeks or months in their GIS departments for updating asset information in their GIS database. **MapViews** from **MentorAPM** is an extension of MentorAPM's GIS features that enables any team member, including operations, maintenance and capital planning, to display and view changes to GIS asset features without having to wait for database updates. The tool facilitates progress monitoring and tracking of network management programs like valve turning, lead replacement and hydrant flushing. The improvements to GIS visibility and reporting optimizes operations, maximizing asset value and helping users make informed capital investment decisions. **434-879-6220; www.mentorapm.com**



Software

CUES GraniteNet Defect Coding Services

GraniteNet Defect Coding Service from **CUES** lets machines process video using AI for consistent accuracy, speed-to-completion and final review by PACP-certified inspectors. It lets users get caught up and allows staff and engineers to focus on more inspiring and productive projects and let the machines do most of the work. CUES also offers a sophisticated decision-support service, called Prescriptive Planning, that is based on the results of the AI-processed inspections to help prioritize risk and organize the types of work that should be done along with the suggested method of repair or replacement, based on out-of-the-box or customized decision logic. Quantify the type of work, assess your budgets and streamline contractor bids for the specific rehabilitation jobs needing to be done. **800-327-7791; www.cuesinc.com**



SmartSights Bundle

A **SmartSights Bundle** subscription leverages the combined capabilities of WIN-911 alarm notification software and XLReporter into one robust package. While this bundle still allows you to access critical data from anywhere at any time with the mobile app, there is now the added benefit of leveraging XLReporter data so you can address issues before they become problems. Additionally, the WIN-911 Mobile app can dynamically refresh reports for a single site or a connected enterprise. To further reduce unplanned downtime, the Failover Utility Feature monitors the health of your WIN-911 Status module and automatically switches to the backup configuration should the primary system experience a failure. **512-326-1011; www.smartsights.com** ♦



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Felling Trailers’ Laurie Engle to retire

Laurie Engle, Felling Trailers’ Inside trailer sales consultant, is retiring after working with trailers for 32 years. Through the years, she built many working relationships with dealers and customers, solving transport problems among many others. Felling’s Trailer Experts work with dealers/customers to configure a trailer to meet the desired specifications and provide a custom solution.

“Laurie has been a strong asset to our team. In addition to her deep trailer knowledge and excellent customer relationships, Laurie’s bright smile and tremendous personality will be missed in the office. I wish her the best retirement, making memories with her family,” says President/CEO Brenda Jennissen.

Superior Environmental Solutions acquires Arrowhead Environmental Services

Superior Environmental Solutions, a portfolio company of Palladium Equity Partners has acquired Arrowhead Environmental Services. The combination broadens SES’ geographic reach into the Southern Mid-Atlantic market, where Arrowhead is based. With approximately 50 employees and 75 active customers throughout the Central Virginia area, Arrowhead represents one of SES’ largest acquisitions to date.

VMAC named one Of Canada’s Best Managed Companies

VMAC has been named one of Canada’s Best Managed Companies for the sixth consecutive year, maintaining its Gold Standard designation. The Best Managed Companies award recognizes VMAC for its global business practices, innovation and sustained growth. Companies are evaluated on leadership in the areas of strategy, culture and commitment, capabilities, innovation, governance and financial performance.

Vermeer’s Mary Andringa named to HDDA 2024 Hall of Fame Class

Mary Andringa, the chair emerita of Vermeer, has been inducted into the notable Horizontal Directional Drilling Association Hall of Fame Class of 2024. This honor acknowledges individuals whose pioneering work and significant contributions have made a lasting impact on the horizontal directional drilling industry. The HDDA is a trade organization dedicated to promoting HDD within the utility and pipeline industry. Its mission includes educating the public and government agencies about HDD’s environmental and economic benefits and limitations.

McElroy launches new website for Australian customers

McElroy launched a new website dedicated to the Australian distributors and customers at mcelroyfusion.com.au. Since 1993, McElroy has served customers in Australia through partnerships with leading local distributors. McElroy equipment is used in many industries in Australia, including mining, water infrastructure and coal bed methane gas extraction. On this new site, users can find information about McElroy’s partner distributors in Australia, including distributors offering certified McElroy rental machines.



Laurie Engle



Mary Andringa

Vacuum Truck Rental announces new managers

Brian Lowry was promoted to regional operations manager of Richland, Mississippi-based Vacuum Truck Rentals. Lowry has been employed with the company since 2012. In his new role, he will be responsible for offices in the Southern U.S. Keith Veros was promoted to general manager of the company’s Livonia, Michigan, location, and Alex Phelps joined Vacuum Truck Rentals as service manager of the Livonia location.

Prior to joining Vacuum Truck Rentals, Veros held positions as a product specialist and territory manager with various organizations across Michigan. Previously, Phelps served as the lead mechanic for a municipal contractor in Michigan, where he oversaw the servicing, maintenance and DOT compliance of a large fleet comprising over 100 pieces of rolling stock. Vacuum Truck Rentals also announced the promotion of Mike Suiter to the position of vice president of strategic accounts. He has been employed with the company since 2017. And Robert Knotts joins Vacuum Truck Rentals as general manager of the Washington, West Virginia location. Prior to joining Vacuum Truck Rentals, Knotts worked in the equipment service industry for over 20 years. Additionally, the company promoted Ty Rose to the position of regional operations manager. In this role, he will be responsible for offices in the Northern U.S.



Brian Hall



Brian Lowry



Alex Phelps



Ty Rose



Mike Suiter

BRAWO Magnavity SX honored by NASTT

The smart light-curing system BRAWO Magnavity SX won the Abbott Award from the North American Society for Trenchless Technology. The award was presented at the No-Dig Show, held in Rhode Island. In the categories of innovation, value, competitive position and impact, the efficient light-curing system from BRAWO SYSTEMS was entirely convincing. BRAWO SYSTEMS is a system provider for the rehabilitation of building and property drainage pipes. In addition to the BRAWOLINER, machines such as the BRAWO Magnavity SX are also developed and sold worldwide under the BRAWO Tech brand.



BRAWO SYSTEMS Sales Manager Andrew Marshall accepts the Abbott Award.

Reline America expands network with Tele-Vac

Reline America has added Tele-Vac Environmental to its network of installers. With over 25 years’ experience serving municipalities, utilities and contractors, Tele-Vac brings a wealth of knowledge and expertise to the table. This partnership will allow Reline America to better serve the Midwest region. ♦

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BETTER FLOW MANAGEMENT

Hybrid electronic and hydraulic valve control provides excellent protection against power outages

By Roger Lah

Motorized valves are typically used to control a single function and offer limited or no capabilities to provide multiple electronic functions with hydraulic backup functions. On the other hand, hybrid electronic and hydraulic control valves can reduce the number of valves required in a system and can offer useful “insurance” against power failures and costly line breaks.

Below are three scenarios where this combination proved to protect systems during power outages.

Scenario 1 – Hybrid multifunction electronic and hydraulic metering valve

When a power failure occurs, there is an arduous and lengthy process that water treatment plant operators need to perform quickly in order to prevent water from overflowing onto the plant floor. It involves manually closing several motorized valves for influent and effluent. Backwashing a filter occurs when a filter starts to clog with entrapped sediment, so water is pumped back up through the filter to expand the filter bed and that water is run to waste. The flow rates are ramped up and then back down during the varied backwash cycle before the filter is brought back online, so the flow rate is important for correct cleaning.

The valves are usually controlled by a programmable logic controller to control flow into a filtration backwash process utilizing Venturi flowmeters. These flowmeters operate on the principle of differential pressure, utilizing the Venturi effect where a fluid’s velocity increases as it passes through a constricted section of the pipe, resulting in a pressure drop. This pressure difference is measured and used to accurately calculate the flow rate.

These butterfly valves are susceptible to cavitation problems and therefore a hydraulic pressure-reducing valve is normally installed upstream to reduce the pressure and prevent cavitation. This traditional arrangement requires significant piping space for two valves and a Venturi flowmeter. Furthermore, power failure to the motor-operated valve can cause significant problems.

Another approach is to replace the hydraulic pressure reducing valve with a hybrid multifunction electronic and hydraulic metering valve. This valve is capable of measuring and controlling flow based on valve position and differential pressure sensors installed on the

valve. It also incorporates anti-cavitation trim to prevent cavitation due to the high pressure drop into the filtration process.

The electronic metering function utilizes dual solenoids and simply changing the upstream closing solenoid from “normally closed” to “normally open” will result in hydraulic valve closure when a power failure occurs. This allows the plant operator to handle other important duties when loss of power happens. The single metering valve replaces the previous lengthy piping arrangement, saving significant space. As the replacement valve discharges directly into the filtration process, a hydraulic pressure limiting function can be added to provide a “hydraulic guarantee” against overpressurizing the system.

Scenario 2 – Combining hydraulic PRV with electronic timed closure

In another treatment plant application, utilizing prefabricated treatment equipment, a hydraulic pressure reducing valve was used to limit the pressure in the process. A relief valve was used to provide protection for a long 10-mile pipeline feeding into the plant, with a fast closing butterfly valve to shut down the process during a power failure. However, this sometimes resulted in a surge. The engineer’s surge analysis determined that the pressure reducing valve was required to close in 12 minutes when this occurs and a standard closing needle valve is incapable of controlling these long closing times.

The simple answer was to modify the pilot control system to perform a switch between the normal pressure reducing function and electronic controlled closing of metering flow to zero flow, in a programmable period.

In addition, a third solenoid was installed to

Clockwise from top: The Port Townsend, Washington, treatment plant has electronic Time of Closure display (Scenario 2); La Habra, California has electronic flow control with hydraulic downstream pressure limiting (Scenario 3); A metering valve at the Manhattan, Kansas, water treatment plant (Scenario 1).



The electronic control system is capable of multiple functions such as flow control and pressure reduction.



switch between the normal hydraulic control to electronic control in the event of a system shut-down. Operators can easily see on the valve controller screen the status of the closing sequence. They can also adjust closing times if the required closing time requires amendment. This valve therefore accomplishes two very important functions. A hydraulic pressure reducing function during normal operation, and an electronic “time of closure” function to prevent surging in the long upstream pipeline.

Scenario 3 - Electronic flow control valve with hydraulic protection of downstream piping

In a recent new treatment project startup, an electronic flow control valve began to open but was barely able to crack open. A check of the downstream pressure gauge revealed that downstream pressure had already reached the setting of the pressure limiting pilot control. It transpired that the water district had forgotten that an isolation valve had been closed some distance downstream.

In effect, the hydraulic control system prevented a pipe break from occurring. The electronic control system is capable of multiple functions such as flow control and pressure reduction. In this instance, the hydraulic pilot was used as “backup insurance” where the pilot control adjustment was set to not interfere with normal electronic multi-function control. The normal operation consists of electronic flow control and electronic pressure reducing control and seamlessly transfers between functions with specialized software. In the event of power failure, or solenoid malfunction, the hydraulic pilot will take over and limit downstream pressure, preventing pipe breakage.

Up to four modulating electronic functions are possible, including flow, pressure sustaining, pressure reducing and level control. Reservoir level control, for example, can include flow control and pressure sustaining control. Conversions of existing altitude control valves often include the hydraulic altitude control pilot for backup control to prevent the overflowing of a tank. Often there is a long pipeline upstream of these valves which is susceptible to surging during valve closure. A hydraulic “surge relief override” pilot control will prevent surges in case of faster than normal valve closure.

Numerous combinations

There are many other hydraulic and electronic functions that can be combined into one valve, which

can reduce the number of valves in an installation, protect aging and sensitive pipes, or prevent overflow of tanks and reservoirs. A particularly popular combination is an electronic flow control with a hydraulic pilot control to limit downstream pressure. This example of hybrid electronic and hydraulic control allows normal electronic flow control unless downstream pressure exceeds the limit of the hydraulic pilot setpoint.

Problem-solving with the valve manufacturer can help provide you with the best option for your unique situation to protect your treatment plant and water distribution network in the event of a power failure. ♦



Roger Lah is the technical sales engineer at Cla-Val, with over 20 years of experience and a deep technical understanding of valves in water-works applications.



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Product Spotlight

Advanced technology takes on municipal inspection challenges

By Craig Mandli

The more pipe a municipality can inspect in a day, the better. That's why pipe inspection systems need to be efficient and easy to use. EnviroSight recently unveiled the Verisight Ultra, the next generation of its pipe inspection push camera system that the company says sets a new standard for efficiency, flexibility and ease of use in lateral pipe inspections.

"The Verisight Ultra is wireless and among the advantages is that two people can be standing at the unit with tablets and both view the same thing, as you can view from more than one device at the same time," says Michael Putney, regional sales manager for EnviroSight. "The operator also does not have to stand right at the reel when utilizing the system."

Designed for portability and affordability, the Verisight Ultra simplifies workflows while delivering high-end image quality, according to Putney. It includes a 1080p full HD touchscreen monitor, which records hi-def video and photos to enable quick and accurate identification of blockages, defects and other issues that may compromise the functionality and safety of underground pipelines.

"To my knowledge, not many push cameras on the market have this feature," Putney says. "The tablet can also be detached. Mounted on the reel, the control box can be adjusted infinitely, which means you don't have to pick up the



entire reel and move it to achieve an optimal operating position or to eliminate sun glare."

Self-leveling, pan-and-tilt advanced camera control options are also available. It also has a compact and lightweight design for easy maneuverability through tight spaces and uneven terrain. The system offers the ability to perform inspections standing up or on its side for added versatility on uneven ground. It offers the choice of 200 or 330 feet of "built-for-distance" cables.

"The Verisight Ultra is ideal for municipal and private or environmental contractors," Putney says. "This is not a plumber's camera for household use. It is made to push for distance in rugged environments, not for multiple bends. It also offers more protective and centering skids around the camera head versus a plumber's camera."

Putney says that, while the camera is fresh to the market after a late January launch at the 2024 WWETT Show, early reviews are encouraging.

"We had many test trials with customers to get user feedback prior to launch," he says. "Their response, along with those at WWETT, has been very positive." **866-348-6071; www.envirosight.com**

SPECIAL REPORT

Superior Signal smoke testing systems reduce wet-weather peak flows



Superior Signal's smoke testing systems help reduce wet-weather SSOs and surface inflow. Superior's smoke candles, fluid and smoke blowers are designed to test sanitary sewers quickly, efficiently and economically. The smoke blowers can be used with smoke candles or fluid to detect common sources of surface inflow and other

faults. Classic smoke candles provide highly visible smoke to find more faults at a longer distance. The Superior 3C Classic smoke candle produces a volume of 40,000 cubic feet of smoke in just three minutes. Join multiple W3C smoke candles to create larger volumes of smoke visible for a longer time. Superior's smoke fluid systems offer a liquid-based alternative for mainline sewer inspection and feature an insulated heating chamber with a stainless steel injector to maximize dry smoke output. Since 1961, Super Signal's cost-effective methods have found sources of leaks and odors. Superior's smoke products are made in the U.S., meet WEF and NASSCO standards and are widely used in tests to meet EPA, ASHRAE, OSHA and NFPA standards.

www.superiorsignal.com/mss; 732-251-0800

SPECIAL REPORT

OZ Lifting Products stainless steel lever hoist



OZ Lifting Products has launched its first stainless steel lever hoist. This reliable solution tackles lifting tasks in the most demanding environments. Available in 0.25-, 0.75-, 1.5- and 3-ton capacities, each one can be provided with 5-, 10-, 15- and

20-foot lengths of lift. Custom rigging is available. OZ Lifting's stainless steel lever hoists are lightweight and easy to operate, delivering smooth operation, even after extended periods of inactivity exposed to harsh, corrosive conditions. Constructed from type 304 stainless steel using food-grade grease, this hoist boasts exceptional corrosion-resistance, ensuring long-lasting performance. Enclosed gearing and sealed roller bearings protect internal components from dust and debris, while the Weston-style braking system guarantees secure load control and operator safety. The lift is ideal for wastewater treatment plants, pharmaceutical and food production, oil fineries and mining operations, and meets NSF H1, CE, ASME/ANSI B30.21, AS1418.2 standards.

800-749-1064; www.ozliftingproducts.com

PRODUCT NEWS

Blue-White APFCL online chlorine and pH analyzer

Maintaining the correct balance of having enough free chlorine in the water distribution system to battle dangerous pathogens, but not so much chlorine that it spoils the taste and smell of the water is crucial. Blue-White's APFCL total chlorine, pH and temperature analyzer will continuously test water for chlorine levels and can alert operators when free chlorine drops below a preset threshold. Blue-White's water analyzers are shipped board-mounted with handles included for easy installation and quick startup. APFCL features include highly accurate, real-time measurement, display and data-logging, measure free chlorine or total chlorine, pH and temperature, LCD and data-logging terminal, and FCL700 Smart Sensor. It is compliant with USEPA 334.0 guidelines.



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WORTH NOTING

PEOPLE/AWARDS

Mikala Lindgren was hired as a stormwater engineering technician by **Evergreen StormH2O**, based in Spokane, Washington.

The **DuPage County Stormwater Management Committee** (Illinois) presented awards for its Sustainable Design Challenge competition:

- Best Overall LEED Design: Lake Park High School (Victoria Pikulinski, Margaret Evers, Faith Collins, Maya Seger, Aiza Sultanali)
- Best Stormwater Design: York Community High School (Grace Hudson, Adison Goble, Nora Conroy, Luke Boskovic)
- Best Energy Design: Lake Park High School (Olivia Kalicki, Kylie Pytlak, Kasandra Baylosis) ♦

CALENDAR

August 11-15

International Water Association World Water Congress & Exhibition, Metro Toronto Convention Centre, Ontario. Visit worldwatercongress.org.

August 27-29

StormCon 2024, Grand Sierra Resort and Casino, Reno, Nevada. Visit stormcon.com.

October 5-9

Water Environment Federation Technical Exhibition and Conference, Morial Convention Center, New Orleans. Visit weftec.org.

October 9-11

Southeast Stormwater Association Annual Conference, site TBA, Chattanooga, Tennessee. Visit seswa.org.

October 21-23

California Stormwater Quality Association Annual Conference, SAFE Credit Union Convention Center, Sacramento, California. Visit casqa.org.

October 22-24

Tennessee Stormwater Association Annual Conference, Montgomery Bell State Park, Burns. Visit tnstormwater.org.

February 25-28, 2025

International Erosion Control Association Annual Conference and Expo, Richmond Convention Center, Richmond, Virginia. Visit ieca.org.

March 5-7, 2025

Wisconsin Land and Water Conservation Association Annual Conference, (site TBA), Green Bay. Visit wisconsinlandwater.org.

April 8-10, 2025

Center for Watershed Protection National Conference, (site TBA), Puerto Rico. Visit cwp.org.

May 18-22, 2025

Association of State Floodplain Managers National Conference, (site TBA), New Orleans. Visit floods.org.

May 20-21, 2025

Washington State Municipal Stormwater Conference, Hilton, Vancouver. Visit wastormwatercenter.org.

June 8-11, 2025

American Water Works Association ACE25 Conference, (site TBA), Denver. Visit awwa.org.

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

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