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Steve Ingle
Project Engineer
Douglasville-Douglas County, Georgia

UNDER CONSTRUCTION

A continuous project cycle enables steady stormwater system improvement for Georgia utility

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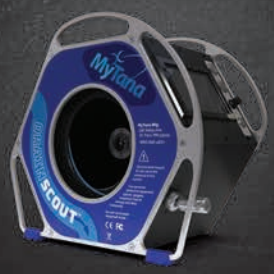

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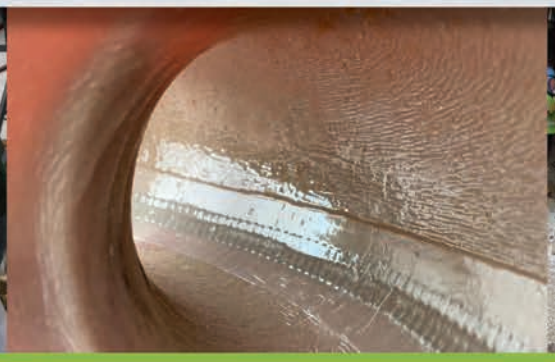

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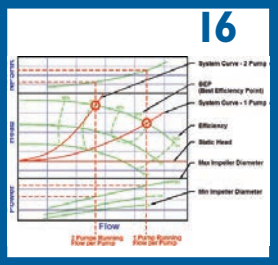
CHEMICAL AND MECHANICAL ROOT CONTROL

ON THE COVER: Douglasville-Douglas County Water and Sewer Authority project engineer Steve Ingle and his team are continually taking on new projects to improve stormwater quality despite rapid development and population growth. (Photography by Kaylinn Gilstrap)



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- SUPPLY SIDE: ADS provides answers for wastewater utilities

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Luke Laggis

Luke Laggis

ROLL WITH THE PUNCHES

Challenges and adversity are nothing new, and they can make us better

I've mentioned before how we're always working months ahead in the publishing industry. You're always looking ahead, too. But it's hard to plan when you have no idea what next month will look like.

This is the July issue, but I'm writing this column in early May, well past my deadline but more than a month before the magazine mails out. I didn't want to write something early and have it be out of touch by the time you read it. Even now, it doesn't pay to say much about a situation that's still changing and evolving by the day.

As noted, it's hard to plan for the unknown. But that's no excuse to neglect the tasks of the day. Roll with the punches and get to what's real, as David Lee Roth sang. There will be a future, and we can't just cover our ears and hope everything goes back to normal.

I think there's comfort in challenge. It's probably one of life's greatest constants. We're all comfortable with what's familiar, but challenges push the little things aside and make us focus on the task at hand, and that's how progress is made. That's how we get better.

Some things will be forever changed, and while that can be unsettling, it's reality. We're looking for new ways of doing business, adapting and setting a new course. There's opportunity in the upheaval.

> **"I just have to approach some things differently and adapt to the new normal."**

I've been working from home since mid-March. My day-to-day is different and there are new challenges, but my deadlines haven't changed. I just have to approach some things differently and adapt to the new normal.

We're still mostly putting the magazine together as we always have, but you'll notice some little changes over the next few months. With the shutdowns, some stories and photos have been harder to get.

As a result, some of our utility profiles will rely more on contributed photos. Starting this month, you'll also notice that we're sharing some of our top stories from the past 10 years. It's a good time to review and reflect, and we feel these stories are worth revisiting. They all rank at or near the top in page views at MSWmag.com over the past decade.

These are all stories that connected strongly with our audience. Whether you read them the first time around or they're fresh to your eyes this time, they still hold lessons, they highlight technology and strategies for working safer and more efficiently, and they give you the opportunity to learn from others' successes. And sometimes looking back can help clarify where you're at now and realign the course forward.

At the end of the day, that's what it's all about. Like another famous '80s icon once said, "It ain't about how hard ya hit. It's about how hard you can get hit and keep moving forward."

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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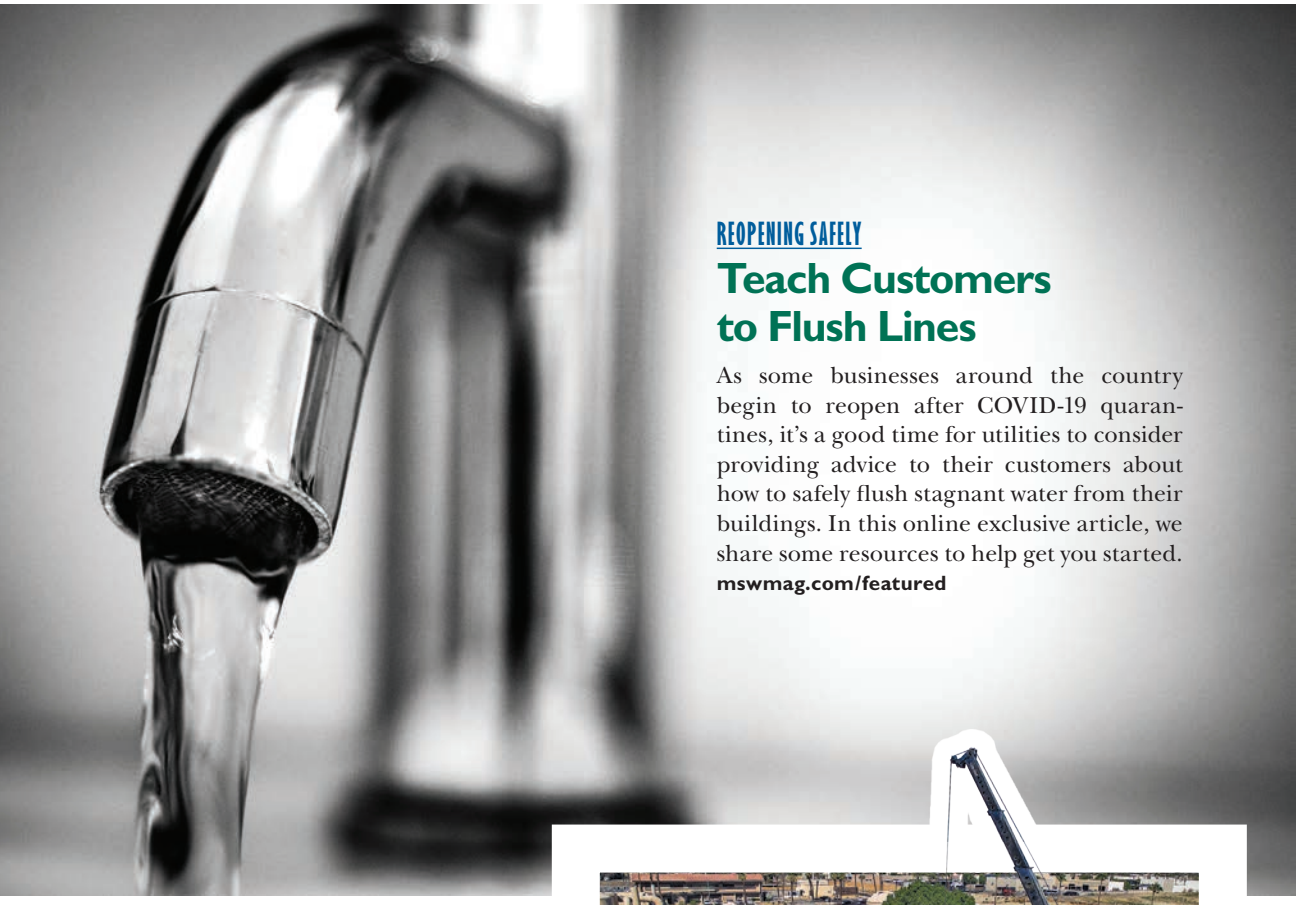

REOPENING SAFELY

Teach Customers to Flush Lines

As some businesses around the country begin to reopen after COVID-19 quarantines, it's a good time for utilities to consider providing advice to their customers about how to safely flush stagnant water from their buildings. In this online exclusive article, we share some resources to help get you started. **mswmag.com/featured**

OVERHEARD ONLINE

Classroom instruction is important, but contractors are hands-on types. There's no better way to master a piece of equipment than doing it yourself under the eye of a qualified instructor.

— ***How to Determine if a Manufacturer Training Will Be Worth Your Time***
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WATERJET CLEANING

Choosing the Right Nozzles

Understanding nozzles and how they work is a key step to becoming a successful pipeline cleaning operator. Knowing the proper use of each nozzle will ensure that you always select the right one for each job. There should be no guessing when selecting a nozzle for cleaning operations. **mswmag.com/featured**

NEW POLL

Voters Want Water Infrastructure

A new poll recently released by the Value of Water Campaign shows that 84% of American voters want state and federal leaders to invest in water infrastructure. The near-unanimous support amid the COVID-19 pandemic reveals that voters value water and want elected officials to prioritize investing in infrastructure — specifically, drinking water and wastewater infrastructure.
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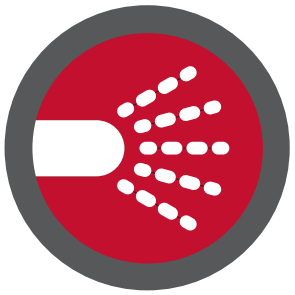

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UNDER CONSTRUCTION

A continuous project cycle enables steady stormwater system improvement for Georgia utility

By Giles Lambertson

Stormwater management is critical in Douglas County, Georgia. The area receives approximately 54 inches of rain each year, compared to the national average of 38 inches.

The Douglasville-Douglas County Water and Sewer Authority's $4.8 million annual stormwater budget is aimed at keeping runoff moving through the county and into the Chattahoochee River. The effort has brought awards from the likes of the Georgia Association of Water Professionals, American Water Works Association, Water Environment Federation and the Upper Chattahoochee RiverKeeper organization.

The WSA's goal is to keep the water moving so the local economy can keep growing. The county seat of Douglasville has doubled in size since 2000, now numbering about 40,000 people, and the county hosts such industrial clients as an Amazon distribution center and a Google data facility.

All of that growth, and the prospect of more, isn't daunting to Steve Ingle, project engineer at the WSA, and his stormwater colleagues. "I think the authority is doing a really good job," he says. "From reports I see of other jurisdictions around here, we do a better job of planning than some."

Stormwater management

The WSA, which serves about 140,000 people including unincorporated areas in the county, was formed in 1985 in response to concerns about uneven funding of sewer lines in new developments. The decision was made to create a water and sewer authority to handle issues surrounding water and wastewater quality in the growing community. Such umbrella utility authorities are not uncommon in the Atlanta metropolitan area, according to Ingle. The WSA is governed by a seven-member board appointed by the city and county. The Douglasville mayor and the chairman of the county board of commissioners are among the members.

"It's our intention to have something under construction all the time."

Steve Ingle

It wasn't until 2003 that city and county leaders decided to incorporate stormwater management into the framework of the WSA. This followed a 1999 decision by federal environmental regulators to begin applying a strenuous permitting process for stormwater management regulations to smaller jurisdictions.

City and county officials looked at the regulations and opted to meet them through an intergovernmental agreement with the WSA. The federal permit requires a governing authority to follow best management practices, perform regular inspections, enforce rules, monitor stormwater movement and continuously educate the public about environmental concerns.

Douglasville-Douglas County Water and Sewer Authority foreman Danny Brumfield uses a Gradall XL3100 to remove an old catch basin top with Joan Salazar, Mason Haggadone and Kade Lambert standing by to assist. (Photography by Kaylinn Gilstrap)

PROFILE:
Douglasville-Douglas County (Georgia) Water and Sewer Authority

SERVICE AREA:
200 square miles (approximate)

WASTEWATER VOLUME:
6 mgd

WATER INFRASTRUCTURE:
944 miles of pipe

STORMWATER INFRASTRUCTURE:
282 miles of pipe

AUTHORITY EMPLOYEES:
200 (across sanitary, stormwater and water-quality divisions)

STORMWATER EMPLOYEES:
26

WEBSITE:
www.ddcwsa.com

Brumfield monitors a storm sewer inspection with a CUES QZ2 portable video inspection system.

"It's worked out very well. Homeowners certainly get their money's worth at $48 a year."

Steve Ingle

After the WSA agreed to take on the responsibility, it immediately completed flood plain studies on each of the nine basins in the county. "All of those studies were done by 2013, and most of the updates to the FEMA maps are complete," Ingle says.

Eight of the basins in the county feed local creeks. One basin replenishes Dog River, which originates outside Douglas County. Sweetwater Creek runs through several other counties before entering Douglas, and its basin is the largest. All of the watersheds are relatively narrow, so while water from a heavy rain might rise fairly dramatically in streams, it falls just as swiftly and moves along.

Steady work

Stormwater projects in the county are almost invariably conceived and executed by the WSA. "The county already had some stormwater problem locations, and county officials made us aware of them when we took over," Ingle says. "We really had full responsibility at that point. I can't think of a capital project in the last few years that hasn't been initiated by us."

Most dirt-moving jobs involve repair or replacement of pipe that is undersized or in poor condition. Two projects out for bid in early April are typical. The Fairways Drive project involves lining 183 feet of a 36-inch corrugated pipe with centrifugally cast concrete pipe and installing a new lid on a buried junction box. And on Dorris Road, a contractor will repair leaking joints and replace a failed downstream apron and wingwall on a concrete box culvert, plus relocate more than 100 feet of 12-inch ductile iron sewer pipe and replace 70 feet of 18-inch metal storm pipe with reinforced concrete pipe.

"It's our intention to have something under construction all the time," Ingle says, noting that a newly hired engineer spends all his time on such projects. "We have a bunch of jobs under design or awaiting easements now. A few of them will soon be out for bids."

The most expensive undertaking in recent years had a $2 million price tag, with the Federal Emergency Management Agency contributing some funds. That job replaced a culvert with a bridge. Because a branch of the stream flowed through a golf course, a bridge for golf carts was also constructed.

FEMA involvement in that project stemmed from massive flooding that submerged the county in 2009 after a September storm cell hovered above the Atlanta area. In Douglas County, 21 inches of rain fell in 24 hours. "It was called a 500-year flood," Ingle says. "All things considered, our system handled it pretty well. We obviously had roads washed out, though."

This all happened six years before Ingle joined the WSA. The 55-year-old project engineer had

> **"The regulators are watching us, but we're regulators, too, watching developers."**
>
> **Steve Ingle**

NO TREATMENT REQUIRED

Some communities and systems are twice-burdened with rainfall.

First, rainwater must be safely channeled so it doesn't flood or otherwise erode the land it falls on. Then it is combined with sewage and delivered to a treatment plant where it is stripped of pollutants and bacteria and screened of suspended solid materials. Only then can it be released to an adjacent lake or moving body of water to start again the cycle of evaporation and condensation.

For the Douglasville-Douglas County Water and Sewer Authority in Georgia, the second step is not required. Blessed with separate sanitary and stormwater systems, the city can let rain that falls in its watersheds run through culverts and under bridges into streams that empty into the Chattahoochee River, which flows along the southeastern side of the county.

"We don't have any public regional detention ponds," says Steve Ingle, project engineer in the stormwater division. "And there doesn't appear to be any locations in the county where we could build a pond that would be of general benefit."

Two large retention ponds do exist in the county. They were constructed two decades ago in conjunction with the development of a mall and surrounding retail outlets. Those private ponds are situated on the developer's property.

The WSA does monitor water quality in the river and creeks that flow through the county, as required by Environmental Protection Agency regulations. Sections in three of the streams are on notice for needing improvement in quality, which the WSA is tasked with accomplishing. Since beginning the stormwater program, seven stream segments have been upgraded and removed from the EPA list.

already worked at the Douglas County water treatment plant in college and was working as a civil engineer for a company in Atlanta. In the wake of the flooding, he was assigned to oversee his company's road repair work in Douglas County.

"It was a blessing to me. I know a lot of our system as a result of working those months on the repair work."

Building infrastructure

Funding for stormwater management in Douglas County comes from a fee charged to homeowners and commercial property owners. A formula, which is common among stormwater utilities, spreads the responsibility pretty evenly among residential and commercial property owners.

It works this way: All single-family residences pay $4 a month, with residential properties not connected to water and sewer lines being billed just twice a year. The $4 fee was pegged to a study that determined an average residential property in the county contained slightly more than 2,500 square feet of impervious surface — that is, asphalt or concrete pavement and buildings. Based on that, the WSA charges commercial property owners $4 for every 2,500 square feet of impervious surface.

"It's worked out very well," Ingle says. "Homeowners certainly get their money's worth at $48 a year."

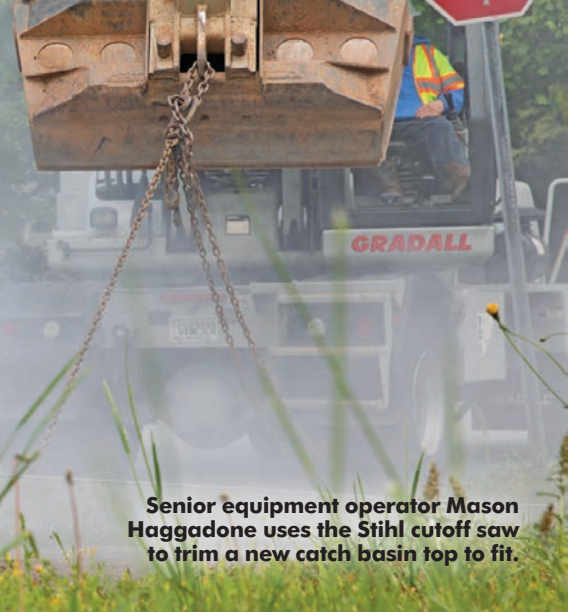
The collected money goes to, among other things, building and maintaining legacy stormwater infrastructure in Douglas County. The oldest subdivision stormwater pipe typically dates to the early 1960s. Pipes in downtown Douglasville and some county culverts are older. A priority list has been worked up to guide planners in scheduling the work.

"Our biggest problem is the relatively large amount of metal pipe in the system," Ingle says. "Our capital projects are geared toward replacing metal pipe with concrete pipe as soon as we possibly can, because concrete has less maintenance."

Some older Douglas County pipe is 12 inches in diameter, with some as small as 8 inches. By contrast, the largest metal stormwater pipe in the county measures 96 inches across, with the largest concrete box culvert being approximately 10 feet by 10 feet.

Best value

Repair or replacement of the 282 miles of stormwater infrastructure is not all contracted



Senior equipment operator Mason Haggadone uses the Stihl cutoff saw to trim a new catch basin top to fit.

Project Engineer Steve Ingle (far left) looks on as Haggadone places a camera inside a drainpipe to find the cause of a road failure while Maintenance Superintendent Ron Stephens and Danny Brumfield watch the progress on the inspection monitor.

out. "We have enough equipment to do construction in-house on many projects," Ingle says. The maintenance department was created, equipped and staffed when the WSA assumed responsibility for stormwater work in 2004.

Two full-time inspectors keep an eye on stormwater infrastructure. Between their inspections and property owner complaints, stormwater managers are kept fully apprised of infrastructure problems. Federal stormwater regulations mandate the rest — routine lookouts for illicit discharges into streams, erosion and sediment issues, and potential construction pollution. "The regulators are watching us, but we're regulators, too, watching developers," Ingle says.

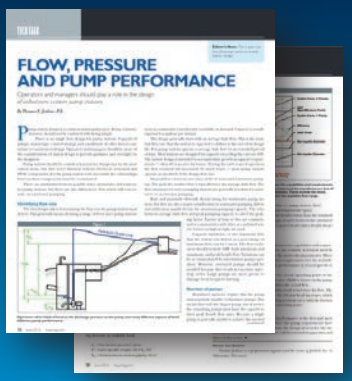
The stormwater division's equipment yard holds four diggers: a Caterpillar 312 excavator, Mustang 800Z mini-excavator, Kubota KX91-3 mini-excavator and Gradall XL 3100 telescopic excavator. A fleet of four International and Kenworth dump trucks haul and dump excavation spoils and bring in construction aggregate. The heavy equipment makes replacement of a corrugated pipe running under a county road a reasonable task.

Ingle and other stormwater engineers are kept busy managing compliance with regulations and reviewing plans for new subdivision and commercial projects. "It can get pretty busy at times, especially when we have new development. This time last year, a lot of new developments were underway because the economy was moving so fast."

Ingle now has the perspective of five years on the job in addition to the time he spent serving the county with an outside firm, and he believes the WSA's stormwater management group will stay in front of future storms.

"I'm really impressed with how forward-looking the WSA is. It operates as a public service and really wants to provide the best service it can for the best value." ✦

2010 — BEST OF THE DECADE — 2020



Editor's note: We're digging through the archives and sharing our most popular stories. This story originally ran in the June 2016 issue of *Municipal Sewer & Water* and has since been viewed more times than any other story on MSWmag.com.

TECH TALK

FLOW, PRESSURE AND PUMP PERFORMANCE

Operators and managers should play a role in the design of collections system pump stations

By Thomas E. Jenkins

Pump station design is a common municipal project. Being common, however, should not be confused with being simple.

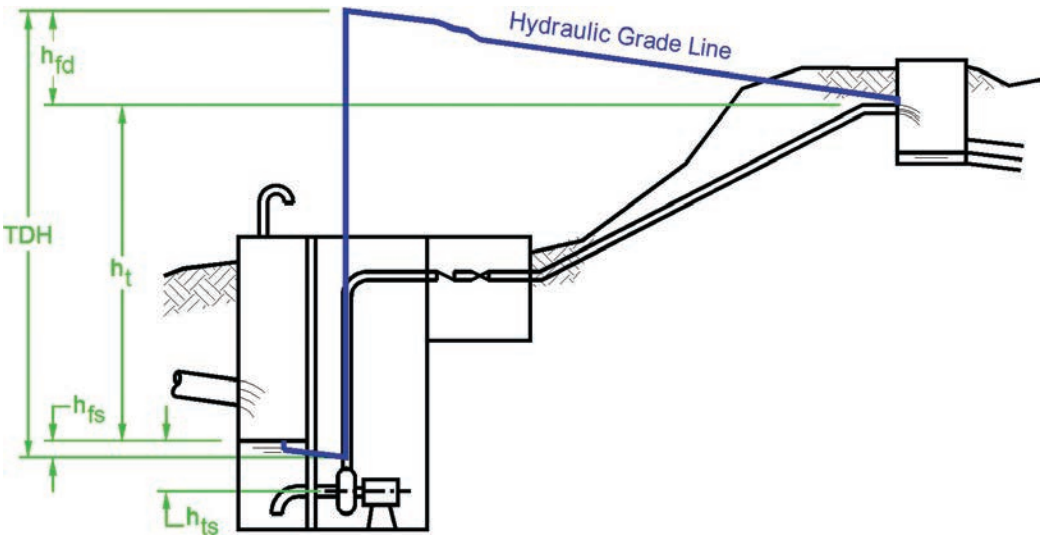
There is no single best design for pump stations. Pump capacity, station type, control strategy and a multitude of other factors contribute to variations in design. Operators and managers should be aware of the considerations of station design to provide guidance and oversight for the designers.

Pump stations should be considered as systems. Pumps may be the most critical items, but they won't function without electrical, structural and HVAC components. For the pump station to be successful, the relationships between these components must be coordinated.

There are similarities between potable water, stormwater and wastewater pump stations, but there are also differences. Wastewater is the primary focus here.

It is important to remember that pumps produce flow, but the system resistance to flow creates head.

FIGURE 1



Operators often think of head as the discharge pressure at the pump, but many different aspects of head influence pump performance.

Identifying flow rate

The first design task is determining the flow rate the pump station must deliver. This generally means defining a range of flows since pump stations must accommodate considerable variability in demand. Capacity is usually expressed as gallons per minute.

The design generally starts with an average daily flow. This is the nominal flow rate that the station is expected to deliver at the end of its design life. Few pump stations operate at average daily flow for an extended period of time. Most stations are designed for capacity exceeding the current ADF. The station design is intended to accommodate growth in capacity requirements — often 20 years into the future. During the early years of operation, the flow required will necessarily be much lower. Most pump stations operate at one-third of the design flow rate.

Diurnal flow variations are a fact of life in water and wastewater pumping. The peak dry-weather flow is typically twice the average daily flow. The flow variations for water pumping stations are generally less than for wastewater or stormwater pumping.

Rain and snowmelt obviously dictate sizing for stormwater pump stations, but they are also a major consideration in wastewater pumping. Inflow

When two pumps operate in parallel, the result is not twice the flow.

and infiltration usually dictate the maximum pumping capacity. The ratio between average daily flow and peak pumping capacity is called the peaking factor. Factors of four or five are common, and in communities with older or combined sewers, factors as high as eight are used.

Capacity turndown, or the minimum flow that the system can deliver as a percentage of maximum flow, can be critical. The flow evaluation should include ADF, daily minimum and maximum, and peak hourly flow. Variations can be accommodated by intermittent pump operation. However, oversized pumps should be avoided because they result in excessive start/stop cycles. Large pumps are more prone to damage from frequent starting.

Number of pumps

Regulatory agencies require that the pump station include standby (redundant) pumps. This means that with the largest pump out of service, the remaining pumps must have the capacity to meet peak hourly flow rates. Because a single pump is generally unable to achieve the needed turndown, most designs use a number of small pumps instead of a large pump and identical standby. The cost of multiple pumps is offset because each pump is less expensive than a large one.

Small pump stations are often "duplex," with two constant-speed pumps. Each pump is capable of handling peak hourly flow.

Head pressure

The second characteristic for pump sizing is the pump head or discharge pressure. The term "head" derives from the height of water that the pump can overcome at a given flow, generally expressed as feet of water (1 foot water = 0.43 psi = 6.3 bar). Operators often think of head as the discharge pressure at the pump, but many different aspects of head influence pump performance (Figure 1).

The difference in head from suction to discharge determines the pump performance and power. This is referred to as total dynamic head.

$h_{fs,d}$ = friction headloss in suction and discharge piping (feet)

h_t = total static head; the difference in elevation of water on the discharge and suction sides of the pump (feet)

It is important to remember that pumps produce flow, but the system resistance to flow creates head. A pump with the discharge pipe disconnected will produce lots of flow but no pressure.

The two components of TDH receiving the most attention in pumping are static head and discharge friction head. Static head is the elevation of the water on the discharge side of the pump minus the elevation of water on the suction side of the pump. For most applications, the static head is nearly constant.

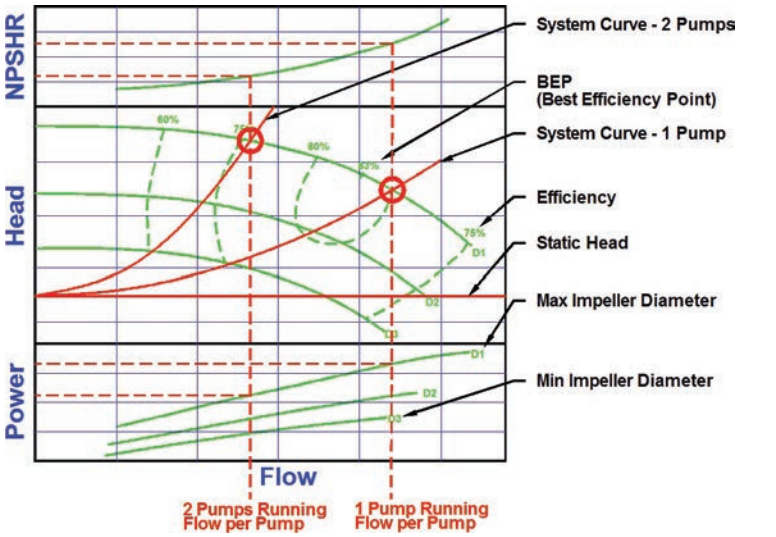
Friction head results from the resistance to water moving through pipe and fittings. Friction loss occurs on both the suction and discharge sides of the pump. Friction losses vary with water velocity squared and with the inverse of the pipe size to the fifth power.

In some applications, such as the headworks of a treatment plant, static head is the largest component of TDH. In other cases, such as pumping through a long force main, friction head is more important. The relative proportions of static head and friction head will affect the pump control strategy and the energy consumption characteristics of the system.

Two commonly neglected but important components of head on the suction side of the pump are the net positive suction head required and the net positive suction head available. Required head is a function of the pump design. It is established by the manufacturer's tests and is displayed on the pump curve. Available and required head are absolute pressures — relative to a vacuum.

Most municipal pumping applications have a flooded pump suction.

FIGURE 2



The pump performance curve summarizes the capabilities and requirements of a given pump. There are a variety of formats used by manufacturers, but all pump curves show the most critical parameters. These include the head, required head and power requirement over the available flow range.

That means that the water level in the wet well is above the pump suction connection. This is one component of available head. Another is barometric pressure. At sea level this equals 14.7 psia (14.7 psia = 1.01 bar = 33.9 feet H2O). As the site elevation increases, barometric pressure decreases.

Vapor pressure is the pressure at which water will boil at a given temperature. Vapor pressure increases as the water temperature rises, with a corresponding decrease in available head.

p_a = barometric pressure (psia)

Y = water specific weight, 62.4 lbf/ft3

h_{fs} = friction loss in suction piping (feet)

h_{ts} = height of water above (+) or below (-) pump suction (feet)

p_v = vapor pressure of water at suction temperature (psia)

Operating a pump when the available head is lower than the required head can result in pump damage. A margin of safety between the calculated available head and the manufacturer's required head values should always be provided.

Pump performance curve

The pump performance curve summarizes the capabilities and requirements of a given pump (Figure 2). There are a variety of formats used by manufacturers, but all pump curves show the most critical parameters. These include the head, required head and power requirement over the available flow range. Most pump curves show the performance at several speeds or impeller diameters.

The pump curve does not identify the actual operating point of the pump. This requires plotting the system curve (TDH vs. flows) on the pump curve. The intersection of the two identifies the actual flow.

When two pumps operate in parallel, the result is not twice the flow. The static head remains constant. However, the friction head increases, which "pushes" the operating flow lower. Plotting a system curve with the friction loss at twice the flow identifies the new operating point.

Looking ahead

Identifying the pump capacity and performance is the first and most critical step in pump station design. Once the pump requirements have been determined, it is possible to continue the design process for the station and its ancillary components. These will be covered in parts two and three of this series. ✦

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.

STOP TOP-TALENT TURNOVER

Say goodbye to exit interviews and embrace an effective retention strategy

By Ken Wysocky

Exit interviews are often used to find out why departing employees flew the coop. Business professor John Sullivan proposes a better strategy: Determine the reasons why key employees stay at your organization and reinforce those factors whenever and wherever possible.

But how can employers determine what keeps key employees happily moored? The professor of management at San Francisco State University recommends what he calls "stay" interviews, in which managers periodically sit down with top-performing employees and ask key questions to suss out the fundamental reasons why they like their jobs.

"It's too late if you're asking people why they're leaving," says Sullivan, a well-known expert on human resource issues who specializes in strategic talent management. "You have to ask them before they leave — ask them why they stay, then reinforce those things. Then they'll never leave."

The concept isn't exactly new. In fact, Sullivan — who has written more than 1,200 articles and 10 books about talent management, including the book *Stay Interviews and Other Powerful Retention Tools* — says he invented the concept back in the late 1990s. But given the problems so many companies have with high employee turnover, it's easy to imagine that not enough organizations use this commonsense solution to stop the steady drip, drip, drip of workplace brain drain.

> **"It's too late if you're asking people why they're leaving."**
>
> **John Sullivan**

There aren't any major obstacles to doing such interviews. They don't cost anything but managers' time, and they don't require any special training either because the process is both simple and intuitive.

Furthermore, the cost of employee turnover is staggering. Estimates about these costs vary widely, but based on his own research, Sullivan says the number is at least three times an employee's salary.

There's another compelling reason for busy managers to make time for stay interviews: Because the program targets only a small population of specific employees, it's easy to track turnover metrics to determine its effectiveness, he notes.

Start the conversation

So what exactly is a stay interview and how should it be conducted? Sullivan defines it as a structured, one-on-one retention interview between a manager and a top-performing employee. It can also target crucial employees who are high risks for departure.

The interview should last about an hour. The primary goal is to identify the factors that drive employees to stay, as well as identify and minimize factors that could spur their departure. Such interviews should be scheduled at least twice a year and more often for top employees identified as flight risks, Sullivan says.

"If job circumstances change for an employee, you may have to do the interviews more often," he explains. "Volatility matters if it changes employees' 'sticky' factors — the things that make a difference to them and keep them on board."

The repeated emphasis on top-performing and key employees here is no accident; this isn't a politically correct kids' soccer tournament where everyone gets a trophy. In short, low-performing employees don't get to participate. Odds are that they're less likely to be lured away anyway, Sullivan points out.

"It's all about job performance and replaceability," he notes. This Darwinian mentality — culling the corporate herd, if you will — may sound harsh. But as Sullivan points out, there's a big difference between a lower-level employee who might cost the organization $100 by making a mistake versus a high-level employee whose error could cost it millions of dollars. Or whose innovation skills could lead to millions of dollars in additional revenue.

What if nonkey employees learn that colleagues are getting stay interviews and ask why they aren't? Candor is critical. "Most managers will lie," Sullivan asserts. "But it's better to hold a meeting and talk to them about their performance and contributions to the organization. Point out that when they perform like the people who get stay interviews, they'll get one, too."

Sticky factors

Managers typically should do the interviews, not human resources personnel. To reduce any anxiety, the manager should begin by pointing out that the interview's purpose is simply to identify things that keep the employee jazzed about his or her job.

Then the manager should quickly segue into praising the employee's performance, thanking the employee for his or her efforts and emphasizing the value that person brings to the organization. Then it's time to get to the meat of the matter: Find out what trips this employee's trigger about their job.

Questions can vary. But here are some examples:

- What factors make you passionate about and committed to your team?
- What three or four key reasons keep you here?
- What factors make you feel like you're having a positive impact on your team, products, customers or community?
- Are there any "wow" factors that keep you excited about your role here?
- What are your career expectations and where would you like to be,

say, two years from now?

- What would your dream job be like?
- Is there anything more I can do to enhance your productivity and commitment to your job?

It's important to focus on positives, not things employees don't like about their jobs. "They key is to identify those sticky factors — get it all on the table," Sullivan suggests. "A lot of managers have no idea what motivates their employees. It's horrible. If you don't know what motivates them, how can you try to retain them?"

Sometimes the responses spur more interviews. For example, some top employees might list a particular colleague (or colleagues) as a chief reason why they enjoy their jobs. In those instances, it's important to also do a stay interviews with that colleague or colleagues, Sullivan says.

Action is critical

Of course, stay interviews become an empty exercise if a manager doesn't act on the information provided. Any delays in reinforcing the sticky factors, or not doing anything at all, increases the chances a quality employee will leave.

In addition, some issues inevitably arise that managers can't resolve on their own. In those cases, it's important for managers to be candid and explain that they must first consult with upper management before taking action. But they should get back to employees with answers in a reasonable amount of time, such as a couple weeks, he advises.

The bottom line: Stay interviews are an inexpensive and effective tool for keeping top talent firmly anchored.

"They make people feel appreciated," Sullivan says. "You only need to look at the data to see that stay interviews work. Research shows that 50% of turnover is preventable and 95% of it is predictable. So if I can stop you from quitting half the time, there's no reason not to do so." ✦

Visit www.drjohnsullivan.com for more information about talent-management issues.

2010 — BEST OF THE DECADE — 2020

Editor's note: We're digging through the archives and sharing our most popular stories. This short piece, which is right on point for the times we're in, was originally posted to MSWmag.com in February 2014 and has since been viewed more times than any other safety story.

STAYING SAFE

HOW TO KEEP SEWER WORKERS SAFE

Simple precautions can go a long way toward maintaining a healthy wastewater crew

By Matt Timberlake

Whether you work in a wastewater treatment facility, on a sewer collections system maintenance inspection and rehabilitation crew, or in residential plumbing cleaning inspection and rehabilitation services, sewer work can pose risks to your health and safety.

General best practices on top of regional or individual health and safety regulations can be an employee's best line of defense. These suggestions are not intended to replace existing policies or procedures and are not all-inclusive.

Waterborne disease is a major concern for wastewater workers. The National Institute for Occupational Safety and Health currently has no official recommendations regarding vaccinations for workers who are in contact with sewage; however, many employers will offer voluntary vaccinations and all workers are encouraged to discuss with their doctors what vaccinations may be right for them.

Four major types of human disease-causing organisms (pathogens) can be found in sewage: bacteria, viruses, protozoa and helminths (parasitic worms).

One of the best lines of defense against pathogens is personal protective equipment to keep contaminates from your body and to keep you free from cuts, scrapes, scratches and other damage to your body. Employers should supply workers with necessary PPE and ensure workers are using the equipment properly.

In addition to proper use, PPE should be handled and disposed of properly in order to not cross-contaminate clean areas. Training on standard hygiene practices for sewer workers conducted by qualified safety and health professionals to cover the risks and policies and procedures of the employer should be done periodically.

The following tips can also be used to prevent illness to workers in hazardous environments:

1. Use gloves to prevent skin abrasions and create a barrier between skin and surfaces exposed to wastewater and debris.
2. Avoid touching face, mouth, eyes, nose, genitalia, or open sores and cuts while working with wastewater and debris.
3. Wash hands thoroughly with soap and water after contact with wastewater and debris, and wash your hands before you eat, drink, or smoke and before and after using the bathroom.
4. Eat in designated areas away from wastewater and debris.
5. Do not smoke or chew tobacco or gum while working with wastewater and debris.
6. Remove excess wastewater and debris from footgear prior to entering a vehicle or building.
7. Keep wounds covered with clean, dry bandages.
8. Thoroughly but gently flush eyes with water if wastewater and debris contact eyes.
9. Change into clean work clothing on a daily basis and reserve footgear for use at work sites or during wastewater and debris transport. ✦

SEEING THE COMMUNITY THROUGH

Colorado utility manager guides his district into a new era

By Jim Force

"It will be the largest single lining project to date and will address lines in all critical corridors and high-traffic roadways."

Eli Jennings

Retired Clifton Sanitation District Manager Brian Woods (right) discusses the consolidation of districts and construction of the new regional treatment plant with former state Sen. Josh Penry.

PROFILE:
Clifton (Colorado) Sanitation District and Brian Woods

FOUNDED:
1967

AREA SERVED:
Communities of Clifton and Whitewater

POPULATION SERVED:
21,000

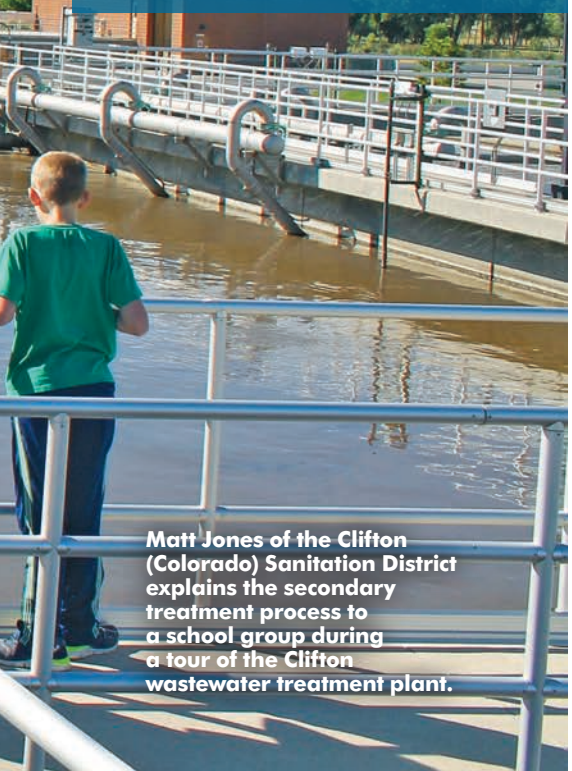
INFRASTRUCTURE:
80 miles of gravity flow sewers, 2.5 mgd biological nutrient removal treatment facility

STAFF:
Eli Jennings, operations manager; Pam Smith, administrative assistant; Jeff Duda, Matt Jones, Matt Talley, Mike Brammer, Travis Dilley, Trevor Workman and Tyler Brumback, collection and wastewater operators

AWARDS:
2015, Rocky Mountain Water Environment Association, Wastewater System of the Year; 2016, Rocky Mountain Water Environment Association, Plant Performance Award; 2016 and 2017, Colorado Special Districts pool, Sanitation District of the Year; 2011 and 2017, Rocky Mountain Water Environment Association, George W. Burke Jr. Safety Award; 2017-20, Environmental Leadership Program, Gold level

ANNUAL OPERATIONS BUDGET:
$2.3 million

WEBSITE:
www.cliftonsanitation.com



Matt Jones of the Clifton (Colorado) Sanitation District explains the secondary treatment process to a school group during a tour of the Clifton wastewater treatment plant.

> **"We want to be as self-sufficient as possible and ensure the investment lasts as long as possible."**
>
> **Eli Jennings**

In the early 1990s, two different districts managed wastewater in Clifton, Colorado, between them operating more than 20 miles of old clay and concrete sewer pipe, several lift stations and three separate lagoon systems discharging to the Colorado River.

Today, the districts have been consolidated into one, the lift stations are gone and much of the sewer system has been modernized and now flows by gravity to a beautifully landscaped 2.5 mgd biological nutrient removal facility that meets tightening requirements for ammonia, nitrogen and phosphorus removal. Dewatered biosolids are applied to the land.

The dramatic progress was the work of Brian Woods, recently retired as district manager.

"Brian Woods began working for the district in 1992," explains Eli Jennings, the district's operations manager. "He became district manager in 2005 and went to work on his vision for the district."

The transformation began immediately. In 2005, one old section of sewer pipe was replaced with new 12- and 27-inch mainlines, and one lift station was taken out of service. The next year, Woods was instrumental in getting the two districts to consolidate into a single entity and starting the planning process for a new mechanical treatment facility.

By 2009, more mainline sewers had been installed and the new extended-air treatment plant and administration building were completed. The district abandoned the old lagoons and remediated their sites.

Thousands more feet of new gravity sewer lines were installed by 2014, and the final lift station was decommissioned. In 2015, the treatment plant was upgraded with anaerobic selectors for phosphorus removal; the final two interceptors were completed through the heart of the district in 2017-19.

Total cost of the projects on Woods' watch totaled $39.6 million — nearly $6 million of that from 29 separate grants he applied for and obtained. The district's debt is due to be retired by 2027.

"Everything that could be prepared for at the time, Brian has completed," Jennings says. "His forethought and vision with each and every capital improvement project has allowed the district to always be prepared for development, replace critical infrastructure prior to failure, and coordinate with road replacement, upgrade or overlay projects."

Doing it all

Clifton is located on the west slope of the Col-

Tyler Brumback explains collections system operation and camera inspection to a group of school students during a tour of the Clifton Sanitation District facility.

EARNING GOLD

The Clifton Sanitation District has received a Gold level classification from the Environmental Leadership Program, a statewide environmental recognition and reward program in Colorado.

The ELP acknowledges organizations that "voluntarily go beyond compliance with state and federal regulations and are committed to continual environmental improvement."

The ELP credited the district with responsible environmental and energy programs that:

- Replaced lighting with LED fixtures and installed a process control analyzer
- Minimized waste by recycling biosolids for land application as opposed to landfilling
- Conserved water by reducing irrigation
- Demonstrated corporate responsibility through beautification and wildlife habitat programs, donations to nonprofit groups, tours and environmental scholarships for students, educational programs for the general public, allowing youth hunting on the property in cooperation with Ducks Unlimited and the Colorado Division of Wildlife

Jennings says the award also recognizes the remediation of the old lagoon sites and the annual tours with area fifth graders, emphasizing water and energy conservation.

Clifton has been a Gold Leader and member of the program since 2017.

"You can be a part of your community and the environment."

Brian Woods

orado Rockies, in the Grand Junction metropolitan area. The area's economy is tied to oil and gas development in the area. The population is around 21,000, having tripled since 1990.

The Clifton Sanitation District is a self-supporting enterprise fund, providing wastewater services to both Clifton and the neighboring community of Whitewater.

While the district started with very limited operational staff — at times just one person — it has grown to nine full-time employees. "Brian hand-picked and trained the entire staff, establishing hiring practices, personnel manuals, rules and regulations, construction standards and specifications, and even the filing systems," Jennings says.

The staff is responsible for both the sewer system and treatment plant. The crew uses a Rausch HD camera system (RauschUSA) to view sewer conditions. "It was one of the first to be used in the U.S. It has lateral launch capability as well."

While the district owns a Vactor combination truck, it frequently uses an outside contractor for sewer cleaning. The company — Simon From Limon, owned and operated by Chris and Jess Solze — employs a unique system where swabs are pulled through the pipes with all debris removed at each manhole.

"It's a good solution for roots," Jennings says. "We clean as frequently as each quarter, and we use the outside contractor annually. But our maintenance system evolves based on where we need to clean and when."

The district has replaced nearly half of the old clay and concrete pipe with new PVC and uses cured-in-place technology to remediate other sections.

"We plan to use CIPP on 22,000 feet of pipe this year," he says. "It will be the largest single lining project to date and will address lines in all critical corridors and high-traffic roadways.

"We're very impressed with trenchless technology. We find it creates a lower coefficient of friction in the pipe, and that reduces grease buildup."

He says the remaining vitrified clay and concrete pipe in the district has been evaluated through an asset management program and will be phased out over the next five years. "That will finalize replacement, resizing and rehabilitation of the entire district."

Because it is not tied to any specific community, the district's wastewater staff is responsible for the engineering, planning and construction management along the collections system. "They do it all."

Better treatment

At the treatment plant, the Clifton staff operates an oxidation ditch, secondary clarifier and

Top: The Clifton Sanitation District facility in Clifton, Colorado.

Below: The Clifton Sanitation District team includes (from left) Tyler Brumback, Pam Smith, Jeff Duda, Matt Jones, Eli Jennings, Matt Talley, Andrew Casano, Trevor Workman, Travis Dilley and Mike Brammer.

UV disinfection system, with an average daily flow of around 1.25 mgd and organic loading of about 40% of capacity.

Using extended aeration, the facility achieves ammonia, nitrate/nitrite and phosphorus reductions in line with new state guidelines for discharge to the Colorado River.

Biosolids are aerobically digested and then dewatered on a centrifuge, as well as open-air drying beds in warm weather. Boisolids are beneficially reused on area farm fields.

"Once the new plant came online, Brian shifted the focus to establishing and maintaining a robust preventive maintenance program with redundancy of parts and adequate tools," Jennings says. "We want to be as self-sufficient as possible and ensure the investment lasts as long as possible."

The district also focused on the grounds around the plant, cognizant of the fact that it is located near neighborhoods, busy roads and public parks.

Jennings says some surrounding properties were purchased to establish the required setback and create a pleasant green space of sod, sprinkler systems and turf trees around the perimeter of the facility, as well as a 3-acre vineyard, a lavender field and six hayfields that are grazed by cattle.

Enjoying retirement

Today, nearly 30 years since he joined the district and 15 years since becoming district manager, Woods is enjoying retirement, comfortable knowing that the system he spearheaded is serving the community and protecting the water quality of the Colorado River.

That's important because he fishes for trout in the river — just one of the many outdoor adventures he pursues.

Woods got into the clean-water profession after working in construction, with many projects related to wastewater including the Clifton collections system. He earned a degree in applied science in environmental restoration engineering technology and completed Colorado certification for both Wastewater A and Collections 4 licenses.

In an American Water Works Association member spotlight, Woods said he felt fortunate to have been part of the team consolidating the two districts and building a new treatment facility that is sustainable to the community and wildlife needs of the area.

Jennings calls his achievements "incredible."

"For many years, he was the only person here. In addition to his accomplishments, he spent 10 years as a Clifton Volunteer Fire Department volunteer firefighter and EMT."

Woods is more modest: "I think getting the two districts to consolidate into one and constructing the new treatment plant were two of our biggest achievements," he says. "And our board was instrumental in those developments. They've been excellent, with several long-term board members."

Woods says the improvements at Clifton have resulted in more consistent, sustainable water quality and that both operating like a business and good planning have kept rates low.

"The future here is extremely bright," he says, noting that's what he tells young people looking for a career. "Don't overlook the clean-water profession. You can be a part of your community and the environment. It's very rewarding." ✦

ADVOCACY IN ACTION

NASSCO wins appeal over use of CIPP in cast iron pipes

By Sheila Joy

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

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

As a 501(c)(6) trade association, it is NASSCO's responsibility to advocate for funding of underground infrastructure, to set quality standards and to ensure the continued acceptance and growth of trenchless technologies. The association's success in its appeal to the International Association of Plumbing and Mechanical Officials earlier this year is an excellent example of what can happen when our industry comes together to make a stand for what is right and does not give up.

NASSCO member Tom Bowman of NuFlow Technologies originally brought to NASSCO's attention concerns regarding the IAPMO Technical Committee's approval of changes to the 2018 UPC, Section 715.3, which banned the use of CIPP in cast iron pipe. Specifically:

715.3 Existing Sewers. *Replacement of existing building sewer and building storm sewers using trenchless methodology and materials shall be installed in accordance with ASTM F1216. Cast iron soil pipes and fittings shall not be repaired or replaced by using this method aboveground or belowground. Replacement using cured-in-place pipe liners shall not be used on collapsed piping or when the existing piping is compromised.*

Of additional concern was the development of the 2021 UPC, Section 715.3, which maintained verbiage prohibiting the use of CIPP in cast iron pipes. Under the leadership of NASSCO's Lateral Committee chair and co-chair, Jason Walborn of Granite Inliner and Carl Marc-Aurele of Formadrain, a plumbing code work group was formed. Headed up by Joanne Carroll, principal at Subtegic Group, members of the work group rolled up their sleeves and got busy.

The strategy was to focus first on having the language prohibiting CIPP stricken from the 2021 UPC and then, if successful, file a Tentative Interim Amendment to have the 2018 UPC modified to remove the ban on CIPP. The NASSCO committee and work group proposed objections at each phase of the 2021 development process, but all appeals were rejected by IAPMO's Technical Committee.

Disappointed but knowing the importance of the appeal, and with the support of legal counsel Connie Wilson of SkarlatosZonarich, NASSCO elevated its appeal to IAPMO's board of directors in January of this year.

On Feb. 26, 2020, NASSCO received notification from the IAPMO board of directors that both the appeal and interim amendment were found to be with merit and the UPC was revised to reflect the following wording:

2018 UPC

715.3 Existing Sewers. *Replacement of existing building sewer and building storm sewers using trenchless methodology and materials shall be installed in accordance with ASTM F1216.*

2021 UPC

715.3 Existing Sewers. *Replacement of existing building sewer and building storm sewers using trenchless methodology and materials shall be installed in accordance with ASTM F1216, ASTM F2561, ASTM F2599, or ASTM F3240.*

NASSCO is extremely grateful to its members, its hardworking committees and the process set forth by IAPMO to be heard. ✦

CHEMICAL AND MECHANICAL ROOT CONTROL

By Craig Mandli

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Cable Machines

1. Duracable DuraFlex

Hair clogs, wadded up paper towels and grease buildup are enough to stop up a drain; tree roots are another challenge altogether. **DuraFlex** cables from **Duracable** can help solve the problem. The cables are manufactured in the U.S. to strict and exacting specifications to ensure the perfect balance between strength, hardness and flexibility. Whether a sturdy, 100-foot inner-core cable is needed to power through tree roots or a nimble, hollow-core 50-foot drain cable, only the finest-quality cables make it through production. Duracable offers a full line of drain machines to put the drain snakes to proper use. Blades and accessories are available as well. **800-247-4081; www.duracable.com.**

2. Electric Eel Model C

The **Model C** dual-cable sectional drain cleaner from **Electric Eel** runs up to 200 feet of 1 1/4-inch, self-feeding dual cable in 8- or 10-foot sections that require no handling when rotating. It spins cable at twice the revolutions per minute of a continuous cable machine for cleaning 3- to 10-inch lines for distances up to 200 feet. One-man operation means less time and labor expense. A heavy-duty, 1/2 hp motor comes standard, and 3/4 and 1 hp motors are also available. A custom-designed gearbox ensures higher quality, lower cost and parts availability. The heavy-duty, fully adjustable safety clutch keeps cable and tool breakage to a minimum and provides overload protection. A fold-down handle allows for easy transportation, storage and use in crawl spaces. Its carry handle allows for balance and easy transport. **800-833-1212; www.electriceel.com.**

3. General Pipe Cleaners/General Wire Spring stainless steel braid hose

High-performance stainless steel braid jet hose from **General Pipe Cleaners/General Wire Spring** enhances the performance and cleaning power of the portable JM-1000 Mini-Jet and JM-1450 water jet drain cleaners. The durable stainless steel braid makes it easier to slide the jet hose down 1.5- to 3-inch drainlines and more easily navigate tight bends. The 3/16-inch Teflon core reduces flow resistance and improves small-line cleaning power. It is available in 30-, 50- and 75-foot lengths. **800-245-6200; www.drainbrain.com.**

4. MyTana M745 Workhorse

The **M745 Workhorse** drain machine from **MyTana** can adjust cable speed on the fly for maximum performance, and it features two torque settings for safety. It incorporates SmartDrive technology, so cable speed can be throttled up to 300 rpm to negotiate turns, strengthen cleaning force, and expedite feeds and retrievals. Speed can also be reduced to as low as 100 rpm for tackling obstructions and debris. SmartDrive sounds an alarm when cable torque approaches unsafe limits and then automatically cuts power when that limit is reached. The machine comes equipped to work in 3- to 4-inch lines with 100 feet of cable, slip-joint fittings, autofeed, blades and accessories. A sink line kit is available to address 1.5- to 2-inch lines, and no tools are needed to swap reels due to the quick-release design of the drive system. **800-328-8170; www.mytana.com.**

5. Pipe Lining Supply Renssi high-speed cable machine

Renssi high-speed cable machines and individual cables from **Pipe Lining Supply** are driven by the technician's existing power source. The machines come in three cable sizes, including 5/16, 3/8 and 1/2 inch. The unit offers cable speeds of up to 3,500 rpm and cuts cleaning time to minutes. Machines come in 50-, 82- and 118-foot cable lengths. In addition to the machines, customers can purchase the cables independently in a variety of sizes and perform drain cleaning with separate cables. By adding a camera option, the operator can see what needs cleaning and attack those areas instead of dragging a cleaning head through the pipe where it might not be needed. **888-354-6464; www.pipeliningsupply.com.**

6. RIDGID FlexShaft K9-306

The **RIDGID K9-306 FlexShaft** drain cleaning machine quickly delivers wall-to-wall cleaning in 3- to 6-inch drainlines up to 125 feet. It is used in conjunction with a full suite of specialized chain knocker accessories that expand to the size of the pipe to clear the entire circumference of grease, buildup, roots and heavy scale debris. The chain knockers are connected to a flexible, nylon-sheathed cable that is fully enclosed for cleanliness and can be easily wiped clean as it is pulled from the line. The fully contained unit also limits job site cross contamination. It can be operated by a foot switch in both vertical and horizontal positions and features a 1.5 hp internal universal motor for maximum power and in-field serviceability. It also

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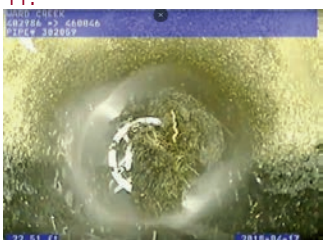

allows for inspection cameras to remain in the pipe throughout the entire drain cleaning process for maximum efficiency. **800-474-3443; www.ridgid.com.**

7. Spartan Tool Model 300

The **Model 300** from **Spartan Tool** has a compact design that is suitable for tight spaces and narrow doorways. Its enclosed inner and outer steel drums keep the mess contained. It can be combined with up to 107 feet of Spartan Tool's Magnum cable for increased power and performance in a compact machine. **800-435-3866; www.spartantool.com.**

Cutting Nozzles

8. Enz USA 10.300R rotating chain scraper

The **10.300R** rotating chain scraper from **Enz USA** is an upgrade from the 10.200R chain scraper. It offers a pipe cleaning range of 8 to 20 inches. The chains are arranged for a multistage cutting concept, and the chain plates are harder and more durable. Because of its sealed bearings, this nozzle can be operated with both clean and recycled water while remaining relatively maintenance-free. It is a powerful root remover and can handle incrustations, concrete residues and other deposits. It can be used to prepare for restoration work such as relining, grouting or applying coatings. Accessories include tap cutters for protruding taps and a wire rope head attachment for gentle cleaning in compromised pipes. **877-362-8721; www.enz.com.**

9. Hydra-Flex Reaper

The **Reaper** rotating jetting nozzle from **Hydra-Flex** has a rotating front jet that provides a 0-degree, straight water stream that blasts at up to 4,000 psi while rotating. Optimized stream quality results in greater impingement, allowing the technician to use one tool for various applications, including cutting, cleaning and removal. Its four rear jets create a 20-degree angle for maximum thrusting and pulling power. This heavy-duty, high-impact nozzle is constructed with a stainless steel housing and tungsten carbide wear surfaces to withstand harsh environments and provide long life. **952-808-3640; www.hydraflexinc.com.**

10. NozzTeq Lumberjack

NozzTeq Lumberjack cutters are low-torque, variable-speed, multipurpose cutting nozzles powered by common sewer jetting or combination trucks. The cutting chains rotate at speeds of 10,000 to 50,000 rpm, depending on pressure and flow rate. The precisely engineered cutter is designed to cut roots, but it also effectively clears out concrete, tuberculation, grease, protruding laterals and other obstructions. Low torque means it won't get stuck, won't harm host pipe and won't spin off the hose end. The cutters are sealed, include grease-lubricated bearings and are water-cooled so they don't need daily maintenance. Five models clear pipes from 3 up to 48 inches. The entire kit includes the turbine, water supply tube, chain plate/pull plate, tow ring, cutting blade, sleds, five sets of chain per sled size, propelling nozzle with jets and adapter, spanner wrench, hand tools and toolbox. **866-620-5915; www.nozzteq.com.**

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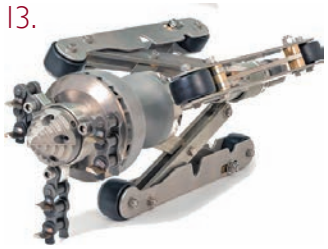

11. Sewer Pro Shop Raptor and Viper

Raptor and **Viper** chain cutters from Sewer Pro Shop are made of high-grade stainless steel and are furnished with ceramic nozzle inserts. With the Raptor, choose from 4- and 6-inch ridged skids or a 6- to 12-inch flexible guide skid, along with cutting chains and carbide bits to achieve quick solutions. Viper chain cutters are designed to remove heavy obstructions caused not only by roots, but grease, mineral deposits and other solid organic material. The unit is driven by a high-performance turbine, which doesn't require any lubrication. Chains spin at speeds of 4,000 to 12,000 rpm. Multiple guide skids available in various sizes make for a service range of 4 to 48 inches. **877-864-9394; www.sewerproshop.com.**

12. StoneAge Warthog WT-1/2

The **Warthog WT-1/2** nozzle from **StoneAge** has been updated with a 1/2-inch inlet option and an R24 head engineered to increase the flow range up to 21 gpm. This configuration enables contractors to maximize use of their higher-flow pumps for more powerful cleaning while maintaining the small form factor of the WT for navigating pipe bends. The high-flow capacity paired with the company's WT 040-R24-C head allows technicians to use the full power of their pump to tackle the toughest jobs and achieve a higher rate of cleaning. The small form factor is optimized for cleaning 3- to 6-inch pipes with elbows. The nozzle's slow, controlled rotation combined with high flow delivers optimal cleaning power for cutting roots or clearing tough deposits. **866-795-1586; www.warthog-nozzles.com.**

13. USB-USA heavy-duty Turbo chain cutter

The heavy-duty **Turbo** chain cutter from **USB-USA** continuously adjusts from 8 to 15 inches (Turbo S200) or 12 to 24 inches (Turbo S600) and easily fits into the pipe. Turbine technology powers the durable chain retainer on a durable body to remove roots, concrete, calcium deposits, hardened grease and tuberculation from sewer lines. The chain cutters are very aggressive for the hardest materials. They have double the amount of turbine-driving water jets as the company's other cutters, generating tremendous cutting power. Easily adjust the cutter to within a 1/16 inch by spinning the rear to make it larger or smaller. Internal 3D fluid mechanics in conjunction with one-piece ceramic nozzle inserts allow the cutter to be used with recycled or clean water. **844-285-5770; www.usb-usa.com.**

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Jetters

14. American Jetter Hot Jetter

Hot Jetters from **American Jetter** include a water-heating system that uses efficient dual-coil burners. Burner exhaust temperatures are reduced from 400 degrees F to around 127 degrees F, effectively releasing less heat into the atmosphere. This is coupled with 20% or more fuel savings from the optional Kohler 19 to 38 hp EFI engines. The increased fuel savings will provide longer runtimes. **866-944-3569; www.americanjetter.com.**

15. Cam Spray CV Series

The **CV Series** cargo van drain jet from **Cam Spray** offers diesel-fired hot water for additional jetting power. Several models are available up to 4,000 psi and 12 gpm. A triplex plunger pump with power pulse valve provides an extra push when needed. Air purge and recirculation to the tank are provided for freeze protection. A 5-gallon fuel tank provides hours of runtime. It comes with a heavily built, powder-coated frame with full deck and 130-gallon water capacity; a 12-volt DC reel with 2-1 clutch drive allowing for free spooling; and a powered hose return. It is controlled by a push button or foot switch. Accessories include a four-nozzle set, storage box, tip cleaner, tiger tail, safety shield, rubber gloves, high-visibility safety vest, 50-foot washdown hose and trigger gun. 800-648-5011; www.camspray.com.

16. GapVax GJet

The **GJet** truck jetter from **GapVax** offers 500- to 3,000-gallon stainless steel water tank options and 40 to 100 gpm water pump options along with a front-mounted hose reel, various toolbox options, room for a vice or crane, and 10-foot tube trays. **888-442-7829; www.gapvax.com.**

17. Gorlitz Sewer & Drain Model GO 1500A Series

The **Model GO 1500A Series** jetter from **Gorlitz Sewer & Drain** has a functional frame construction with a carrying handle, reel accessory tube, retractable pull handle and phenolic 4-inch wheels for easy transportation to the job site. All models come with a custom-built, dual-capacitor, 2 hp electric motor drawing 19.8 amps at full load. The duplex ceramic plunger pump with dual pulsation will generate more than 1,500 psi at 2.1 gph to clear tough stoppages or open frozen pipes. The unit is supplied with one 1/8-inch by 50-foot-long trap hose to clear drainlines 1 1/2 to 3 inches in diameter. The hose and reel connections are provided with quick-disconnect fittings to simplify operation. The reel accessory tube accepts an optional hose reel for compact hose storage and operation. **562-944-3060; www.gorlitz.com.**

18. HotJet USA Xtreme Flow III

The **Xtreme Flow III** trailer jetter from **HotJet USA** offers 18 gpm at 4,000 psi jetting power, clearing drains from 2 to 24 inches. It offers twin 35 hp Vanguard engines on a 5-by-14-foot, heavy-duty, 10,000-pound-rated trailer. It is designed to bust through any clog, roots or debris. **800-213-3272; www.hotjetusa.com.**

19. Sewer Equipment Model 800-HPR Series IV

The **Model 800-HPR Series IV** truck jet from **Sewer Equipment** offers the same features as the 800-HPR ECO, such as fully baffled Duraprolene water tanks, eco-friendly operating system, 190-degree rotation of the hose reel and an insulated, heated enclosure housing all water components, but it adds a rear door that closes fully while the hose reel is extended, keeping heat inside the enclosure where water components are stored. It offers wintertime recirculation of the water system at highway speeds, a retractable canopy for sun and inclement weather, and boiler to provide onboard hot water for cold-weather applications. The dual reel configuration touts two hose reels in one location, with the secondary reel allowing for the addition of a televising jet pod or small-line sewer hose, giving operators the ability to perform multiple applications using one truck. It has ergonomic controls, an operator station situated between hose reels in a dual hose reel configuration and a secondary operators station at midship. **888-477-7611; www.sewerequipment.com.**

20. Super Products SuperJet

The **SuperJet** truck-mounted jetter from **Super Products** is used to blast debris to clear blockages and maintain sewer lines when vacuuming extraction is not required. It uses a strong and smooth single-piston water pump to create consistently high water pressure. Units come standard with rotationally molded polyethylene water tanks in a modular design to accommodate water capacities ranging from 1,080 to 3,240 gallons. Additionally, they offer convenient standard curbside and street-side fill for municipal and residential sewer cleaning. The highly accommodating hose reel has 1,000 feet of 1-inch-diameter sewer hose, 200-degree rotation and a digital monitor. This allows operators to work efficiently while positioning themselves out of traffic and other hazards. The monitor displays a hose footage count, offers 20 saved settings for hose reel payout and is designed with LED panel lights to enable readability in a variety of environments. **800-837-9711; www.superproductsllc.com.**

21. Vac-Con Hot Shot

The **Hot Shot** high-pressure water jet machine from **Vac-Con** is designed for removing stones, bottles, cans, grease, sludge and other debris from sanitary sewer and/or storm lines. Engineered for one-person operation, all high-pressure water and hose reel controls are located at the front of the machine for ease of operation and increased safety. Models are available with 1,000- and 1,600-gallon water tanks. Options include variable flow, articulating hose reel, polyethylene water tanks, 30 gpm at 3,000 psi water pump system, auxiliary engine or hydrostatic drive, cold-weather recirculation system, side-mounted toolboxes, air purge system, hose footage counter,

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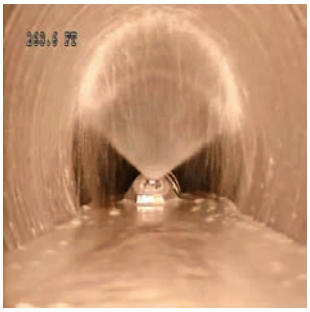

arrow board, strobe lights, inspector cam, high-pressure spray bar, hose rewind guide, 600 psi handgun system with 25 feet of hose, and a selection of nozzles. **888-920-2945; www.vac-con.com.**

22. Vactor Ramjet

Vactor's Ramjet truck-mounted jetter offers IntuiTouch technology that delivers improved operating ease, quick accessibility to key information and greater control on jobs. IntuiTouch in-cab controls provide PTO activation at the touch of a button. Outside, operators can use the IntuiTouch ergonomic control station that features a simple, up/down adjusting control panel for all cleaning system functions. It also offers improved water plumbing, allowing for greater storage options. Other features, including a Jet Rodder water pump and Park-N-Clean technology, come standard. It also includes a cold-weather package that separates wet and dry items and a rear hose reel with optional integral aluminum shroud for optimal performance in cooler environments. **800-627-3171; www.vactor.com.**

Mechanical Root Cutter

23. Picote Solutions Mini Sweeper

The **Mini Sweeper** from **Picote Solutions** is designed to clean and descale pipes, including removing tree roots. It grinds away debris from the inside of the pipe at 1,000 to 1,500 rpm. The aggressive tool is effective in situations where there is thick scale, rust or other waste materials that are difficult to remove. It can also be used to remove wrinkles in liners or to remove excess lining material from the pipe wall after a failed liner has been removed. It is rebuildable after the legs become dull. It is available for 2-, 3- and 4-inch pipe sizes and is powered by the Picote Mini or Maxi Miller. **708-267-6366; www.picotesolutions.com.**

Root Chemicals

24. Lenzyme Trap-Cleer foaming root control

Foaming root control from **Lenzyme Trap-Cleer** has double the active ingredient dichlobenil of previous solutions, along with a latex base designed to help it stick to roots longer. It is easy to apply and provides a slower foaming action to coat the entire pipeline and eliminate fast-foam-over messes. **800-223-3083; www.lenzyme.com.**

25. RootX chemical root control

Chemical root control from **RootX** is a long-term solution to pipeline root intrusion. It stunts new root growth without damaging the pipe, clearing pipeline roots that can cause blockages and sanitary sewer overflows. The chemical won't harm water treatment systems and is registered with the U.S. Environmental Protection Agency for both sanitary and storm use (EPA Reg. No. 68464). Simplicity of application enables crews to perform root control on demand or as scheduled preventive maintenance. **800-844-4974; www.rootx.com.** ✦

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CHEMICAL AND MECHANICAL ROOT CONTROL *By Craig Mandli*

Chemical treatment helps remove root infiltrations

Problem:

Sanitary sewer overflows are one of the largest costs to municipalities, and the majority are root related. In one case, the town of Meno, Oklahoma, was experiencing stoppages and overflows throughout the city. In January 2019, Mayor Rick Goodman and the board of directors for the city of Meno decided to move forward.

Solution:

In order to provide a comprehensive risk management program for its 500 municipalities, Oklahoma Municipal Assurance Group partnered with **Duke's Root Control** to provide sewer root control treatments to participating municipalities via a $5,000 matching funds grant program. OMAG begins with providing a Sewer Line Rapid Assessment, or SL-RAT, tool from InfoSense to the participating municipality. The SL-RAT is a portable on-site assessment tool that identifies capacity issues in gravity-fed sewers within minutes, without the need for traditional CCTV and at a fraction of the cost. OMAG trained the team on its use and loaned them the instrumentation for two to three weeks. In Meno, 14,000 linear feet were inspected, and the SL-RAT identified significant blockages and poor scores. The lines were treated using Duke's **RazoRooter II,** an herbicide-laden, thick foam that kills roots on contact, penetrating through wye connections and killing roots in laterals as well.

RESULT:

Upon inspection of manholes after treatment, there were no stoppages and no overflows in the city. RazoRooter II allows roots to decay naturally and slough away, with regrowth delayed for two to three years. **800-447-6687; www.dukes.com.** ✦

Product Spotlight

A chain cutter designed for tight spots

By Tim Dobbins

Prepping pipe for rehabilitation, reinstatement or general maintenance can be a time-consuming task without the right equipment. Often the pipes that need to be cleaned are in tight areas that are hard to access with the correct equipment. EPL Solutions designed the SpeedCut high-speed chain cutter to be a compact, lightweight machine that can reach tight spots while retaining plenty of power for tough jobs.

"It is more compact than comparable products," says Kaylee Bartucciotto, associate operations manager for EPL Solutions. "It's narrow enough to fit through standard doorways, and it's light enough to be maneuvered and operated by one person."

The idea was to create a chain cutter that would save operators time and money on the job site by focusing on ease of use and one-person operation.

Additional features include an anti-flip SpeedShaft cable designed specifically for drain cleaning, descaling and prepping 2- to 6-inch-diameter pipe for trenchless coating and lining. With its compact design, EPL Solutions uses a clutchless motor that allows the cable to rotate at higher speeds than many other available chain cutters.

"The SpeedShaft cable was tested in this application for three years with a variety of motors," Bartucciotto says. "After testing several motors, we customized a DC motor that is twice the speed and twice the strength."

The SpeedCut only requires an 110-volt, 15-amp outlet for power, so a separate generator is not needed for jobs where electricity is available. The DC motor provides high torque and up to 3,200 rpms at less than 15 amps. It has been tested to run through harsh conditions, and it features variable-speed controls so operators can match the right speed for the job at hand.

EPL Solutions also focused on ease of use during the design process, with multiple components of the SpeedCut directed toward operator efficiency: A built-in, hassle-free oiling system means less time is spent on maintenance while a snap-on SpeedConnector can be crimped by hand without any special tools or set screws. It's compatible with other brand attachments, so operators can quickly make changes in the field.

"It is versatile for pipe sizes and also diverse in application," Bartucciotto says. "We've heard it's easy to handle and hassle free."

Other feedback from operators using the product has been positive, with one person saying that a descaling job was finished in a fraction of the time with this machine versus a comparable product. **714-453-9760; www.epls-usa.com.**

Flomatic Valves Model Cycle Gard pressure pump control valve

The Model Cycle Gard IV CB152SST from Flomatic Valves is a stainless steel, direct-acting, constant-pressure pump control valve with tappings. The body is equipped with 1-inch NPT-size female inlet threads and 1-inch NPT union end female outlet connection. The valve's standard pressure range is 15 to 75 psi with an optional 15 to 150 psi range. The valve body maximum pressure rating is 400 psi. All of the valve's internal parts are corrosion resistant with a stainless steel spring and fasteners for long service life. It maintains a preset operating pressure, reduces rapid pump cycling and is proven protection for wells and booster pumps. **800-833-2040; www.flomatic.com.**

Thermo Fisher Scientific OdaLog gas data loggers

OdaLog gas data loggers from Thermo Fisher Scientific, distributed in the U.S. by CAS DataLoggers, are used to record the level of hydrogen sulfide emissions and other gas emissions in pumping stations, manholes and sewer lines. Originally established in Australia in 2009, the OdaLog was designed in conjunction with wastewater authorities to survive the hot and humid conditions found in those areas while recording parts per million gas levels. It comes in three models: the Type 2L-SL with a standard sensor, the Type L2-LL with a long-life sensor and the Type RTx with a cellular modem. Bluetooth is available on all of the loggers, and they are supported by OdaStat software for device configuration. **800-956-4437; www.casdataloggers.com.**

Pipeline Renewal Technologies Micro S Light+ rehab cutter

Pipeline Renewal Technologies' Micro S Light+ is designed to tackle small-diameter rehab work. The versatile cutter can be used in a wide range of applications and has the flexibility to navigate smoothly through elbows in lined 4-inch pipe. The joystick control offers three axes of motion: 400-degree rotation, 90-degree swivel and 4-inch axial feed. Pressurized with nitrogen, the sealed head carries an IP54 rating, accepts various cutting bits and detaches for easy transport. The entire system weighs just 104 pounds and can be easily transported on a wheeled cart. **866-936-8476; www.pipelinert.com.**

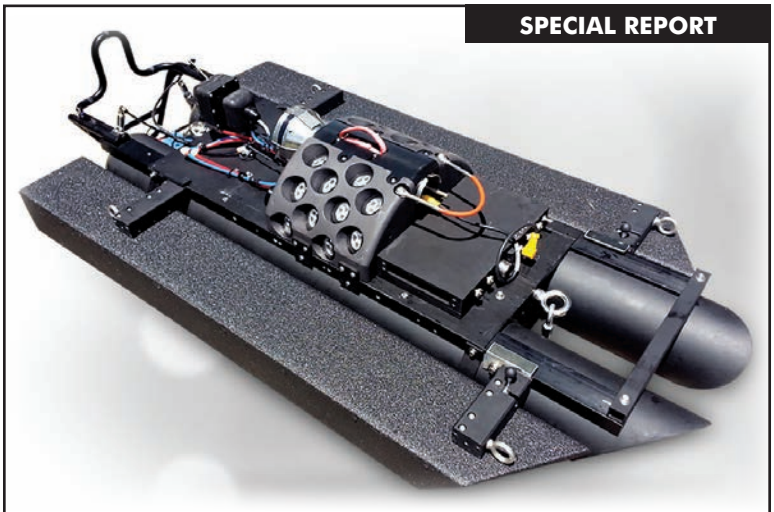
FLIR Systems GF77a Gas Find IR camera

The GF77a Gas Find IR camera from FLIR Systems is its first fixed-mount, uncooled, autonomous leak detection camera designed specifically to visualize methane, sulfur dioxide and other industrial gases, improving inspections and reducing the chance of false readings. Featuring a High Sensitivity Mode, the technology enables better detection capabilities by accentuating movement to make gas plumes more visible to the user. The radiometrically calibrated GF77a also measures temperature, making it a solution for monitoring tank levels and inspecting components that may overheat. The GF77a provides advanced connectivity protocols that allow for seamless integration into gas monitoring systems. **866-477-3687; www.flir.com.**

Generac Industrial Power G4.5L engine

Generac Industrial Power's G4.5L naturally aspirated engine has an engine block that offers an integrated oil to water cooler for reduced oil temperatures and increased oil life. Five four-bolt main caps provide increased strength and rigidity. A forged crankshaft provides superior strength and durability with precise balance for long bearing life and reduced noise, vibration and harshness. Forged connecting rods with fracture-spilt caps provide strength and reduced cap shift, improving bearing life. High-performance cast aluminum pistons are designed for long engine life. Optimized skirt profile reduces friction and scuffing while chrome-coated piston rings ensure long life and reduce wear. A front-end drive with automatic belt tensioner extends the engine's life and reduces maintenance. **888-436-3722; www.generac.com.** ✦

SPECIAL REPORT



CUES SoLID FX multisensor inspection system

The CUES SoLID FX multisensor inspection system is for large-diameter pipes — 18 inches and larger. The system can do 2D condition assessment to determine the remaining useful life or 3D rehab planning to obtain accurate dimensions of bends and underground structures. The standard sensors, including the high-definition digital video camera, 2D-LIDAR and profiling SONAR can be deployed up to 3,000 feet from a CUES Steerable MudMaster crawler or up to 5,400 feet on a CUES SFX Float. **800-327-7791; www.cues.com.**

Pipe Lining Supply adds new technical representative


Steve Maszczak

Pipe Lining Supply hired Steve Maszczak for the technical representative position serving the Northeastern U.S. He brings more than 10 years of CIPP experience to Pipe Lining Supply. He started as a CIPP technician, moved to foreman and worked in sales and project management for the past seven years. Maszczak will support the company's customer base with training, advice and sales for CIPP lateral lining and AIPPR pipe coating projects for drain, waste and vent in Pennsylvania and surrounding states.

InfoSense receives Privacy Shield certification

InfoSense has been certified by the U.S. Department of Commerce and European Union under the EU-U.S. Privacy Shield Framework. Companies self-certified through the Privacy Shield Framework are committing to General Data Protection Regulation data transfer requirements, ensuring data protection obligations for European Union customers. The framework is administered by the International Trade Administration and U.S. Department of Commerce.

Komatsu rebrands company-owned distributors

To better support customers and leverage the power of its wholly owned network, Komatsu has created a new structure in North America to strengthen the growth of company-owned distributor branches. A new corporate unit within Komatsu has been created, effective immediately; all company-owned distributor locations will be branded Komatsu to reflect their inclusion in the company's global footprint. With the alignment of these larger groups of premiere distributors, customers will have access to additional equipment and parts inventory, as well as greater service and support resources. Trade territory for the renamed branches remains the same, as do all equipment lines and services provided.

HOBAS Pipe USA personnel announcements


Keithe Merl


Ed Kocurek


Martin Dana

HOBAS Pipe USA made a few personnel announcements. Edward "Ed" Kocurek is stepping down as president and CEO. Kocurek had served the company for nearly 34 years in a variety of roles. He has presided as president and CEO of HOBAS Pipe USA for the past 20 years. Martin W. Dana, who joined the HOBAS Pipe management team as vice president of sales in January 2018, has been promoted to the position of president and CEO, effective April 1.

The company also announced Keithe J. Merl, P.E., as the newest member of the HOBAS Pipe USA sales team. He will serve the Northeast U.S., including New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Vermont, New Hampshire, Maine and Rhode Island. He is a professional geoengineer with more than 20 years' experience serving clients in the private, public and municipal sectors in the Northeastern U.S. Merl replaces John Mele, who has been promoted to the newly created position of national business development manager for HOBAS Pipe USA.

Anue Water Technologies hires new sales manager, technical staff


Bob Negley


Avantika


Phanni Peddi

Anue Water Technologies has hired Bob Negley as sales manager. He will be responsible for commercial affairs, working with channel partners to place the company's products. He brings 34 years of water treatment industry experience, including 12 years in industrial and commercial boiler, cooling, odor control and wastewater applications and 14 years in chemical applications for scale inhibition in water treatment, oil field, and pulp and paper.

Anue also announced the addition of Phani Peddi as technical services manager and Avantika as applications engineer. Both will provide day-to-day technical assistance to channel partners and end-user customers.

Capriotti appointed as director of sales and marketing for Griffco Valve


Donelle Capriotti

Griffco Valve announced the appointment of Donelle Capriotti to the position of director of sales and marketing. She will be responsible for expanding the company's distributor network, improving working relations with channel partners, and managing marketing and advertising programs. Capriotti joins the company from Wanner Engineering, where she served as director of business development. She previously held positions as a regional sales manager for Viking Pump, business development manager for ProMinent Pumps and general manager for Durameter Pump.

Generac Power Systems names new industrial dealer

Generac Power Systems announced that Bud Griffin and Associates will represent Generac as a new distributor. BGA will represent Generac Industrial Power as an exclusive dealer in Arizona, southern New Mexico and the El Paso region of Texas. BGA is one of only 30 such distributors throughout North America.

ACPA announces new vice president of marketing


Michael Kremer

The American Concrete Pipe Association announced Michael Kremer as vice president of marketing, a newly created position to advance the association's efforts to meet the critical need for resilient and sustainable infrastructure in the U.S. In this new role, Kremer will lead the development and implementation of the organization's marketing strategy, messaging and materials that support the association's strategic mission and industry objectives. ✦

WORTH NOTING

PEOPLE/AWARDS

Judy Nitsch, founding principal of Nitsch Engineering in Massachusetts, retired from the company she founded in 1989. Chairman and CEO **Lisa Brothers** will continue to lead Nitsch Engineering, which has spearheaded numerous stormwater projects over the years.

Tom O'Hara was named director of the Surface Water Management Division of the Genesee County (Michigan) Drain Commissioner's Office. He replaces **Jim Gerth,** who retired after 44 years with the county. O'Hara's duties include overseeing stormwater management.

Rita Davis was named stormwater director for the city of Elizabethtown, Kentucky.

The Rhode Island Department of Environmental Management awarded $569,500 in matching grants for three projects to mitigate water pollution from stormwater and nonpoint sources. The grants were made possible through federal funding from the Environmental Protection Agency under the Clean Water Act. Projects receiving funding are the **Bristol Police Station Stormwater Improvement Project, Narrow River Stormwater Installation in Indian Trail Neighborhood** and **Septic System Replacement at Portsmouth Public Works Garage.**

Cornell University professors **Christine Goodale** and **Todd Walter** and Penn State assistant professor **Lauren McPhillips** received a 2020 Best Paper Award from the American Society of Civil Engineers' Journal of Sustainable Water in the Built Environment. Their paper is titled "Nutrient Leaching and Greenhouse Gas Emissions in Grassed Detention and Bioretention Stormwater Basins."

The **city of Lumberton** (North Carolina) received a $6.8 million grant from the U.S. Department of Commerce's Economic Development Administration to improve stormwater drainage in the Tanglewood community and reduce the risk of flooding. ✦

CALENDAR

July 12-15
American Society of Agricultural and Biological Engineers Annual International Meeting, to be held virtually. Visit www.asabe.org.

Aug. 3-5
Florida Rural Water Association Annual Conference, Hilton Daytona Beach, Daytona Beach, Florida. Visit www.frwa.net.

Aug. 8-12
American Society of Civil Engineers Pipelines Conference, San Antonio Marriott Rivercenter, San Antonio. Visit www.asce.org.

Aug. 10-13
National Association of Flood and Stormwater Management Agencies Annual Meeting, Stein Eriksen Lodge Deer Valley, Park City, Utah. Visit www.nafsma.org.

Aug. 17-19
StormCon, Washington State Convention Center, Seattle. Visit www.stormcon.com.

Sept. 14-16
National Rural Water Association WaterPro Conference, Phoenix. Visit www.nrwa.org.

Sept. 30-Oct. 1
Southern Nevada Water Authority WaterSmart Innovations Conference and Exposition, South Point Hotel and Conference Center, Las Vegas. Visit www.watersmartinnovations.com.

Oct. 20-22
New Jersey Water Association Management and Technical Conference, Golden Nugget Hotel, Atlantic City, New Jersey. Visit www.njwater.org.

Oct. 28-31
American Society of Civil Engineers Annual Convention, Disneyland Hotel, Anaheim, California. Visit www.asce.org.

Nov. 9-12
American Water Resources Association Annual Conference, Embassy Suites by Hilton Orlando Lake Buena Vista South, Kissimmee, Florida. Visit www.awra.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.*

CLASSIFIEDS

see photos in color at www.mswmag.com

POSITIONS AVAILABLE

GapVax, Inc., a nationally recognized manufacturing business, is seeking a talented, highly motivated individual to fill a full-time Sales Position in the Midwest (Iowa based preferred) region. GapVax is the leading manufacturer of industrial and municipal vacuum units and hydro-excavation units in the United States. We provide the most reliable, comprehensive, and efficient mobile vacuum units in the industrial and municipal markets. Specifications of the position are listed on our website, www.gapvax.com, click on the Now Hiring link in the left hand column. Send resumes to or betty@gapvax.com or 575 Central Avenue, Johnstown, PA 15902 (MBM)

SERVICE/REPAIR

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