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December 2017

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improvement and overall water quality earns
it Best of the Best honors

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Burt Knight,
Water and Sewer Director
Greeley, Colorado

City of
Greeley
Colorado



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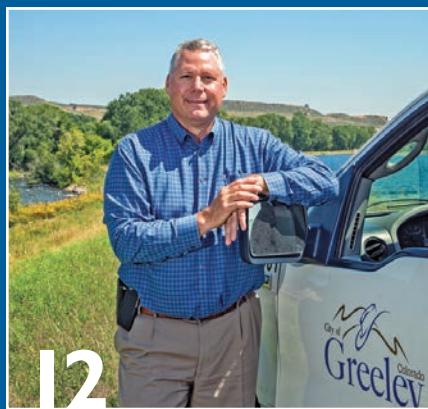


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CLEANING AND MAINTENANCE



ON THE COVER: Water and Sewer Director Burt Knight and his team in Greeley, Colorado, earned the Best of the Best award in the American Water Works Association water-taste competition this year. (Photography by Carl Scofield)



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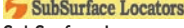


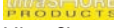



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


Kayla Bisnette

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FROM THE EDITOR

Luke Laggis

I always appreciate it when people tell me they read the magazine. As a magazine editor, the conversation sometimes feels one-sided, like I'm doing most of the talking. But it's the responses, the feedback, the conversations with you that drive every story we turn out. It's a partnership in that way, and partnerships are important.

I'd like to see utilities working together more. We try to facilitate that in *Municipal Sewer & Water*, holding up examples of good utilities for others to follow. A utility in Colorado can't directly help a city on the East Coast manage its collections system, but it can share knowledge and experience that provides the East Coast city with a good approach to a shared problem. In that way, the success is shared, too.

I just returned from WEFTEC, the Water Environment Federation's Technical Exhibition and Conference. It's always good to catch up with others in the industry and find out what's going on outside my own little

bubble. I came away with some new perspectives and ideas for 2018, and I talked to a lot of people who want to share stories that'll help make your utilities stronger.

I talked to a gentleman from the Greenwood Metro District in South Carolina. He told me about the district's aging collections system, the efforts to reduce inflow & infiltration, and all the work his team is doing in-house. The district's experiences and successes can certainly provide some valuable lessons and perspective for other utilities with shared challenges.

I also had the opportunity to talk to a member of the DeSoto County (Mississippi) Regional Utility Authority's board of directors. He told me about how one of the member communities, Olive Branch, has grown from a population of approximately 3,500 in 1990 to 36,000 today. At times, construction was happening so rapidly that the wastewater utility had a hard time monitoring and inspecting all the work to ensure standards were being met. The utility is now working to get everything up to standard, and it has made a big effort to reduce inflow & infiltration. There are good lessons to be taken from this story as well.

There was another conversation with a representative of Portage (Indiana) Utilities. The city's treatment division took over the field division five years ago. Operation of the collections system used to be very reactive, but it has become much more proactive over the past five years. The utility has made some great strides, including eliminating most of its combined sewer overflows.

I'm hoping to bring you all three of these stories in the near future.

The next big industry event is the WWETT Show in Indianapolis. There's no bigger gathering of wastewater professionals. I always look forward to it, primarily for these types of conversations. It's where you and I connect beyond these pages, and where partnerships are formed. It's still a few months away, but I hope to see you there.

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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OUTREACH

The Louisville Water Model for Successfully Communicating to the Public

The Louisville Water Company, featured in the July issue, knows what it is doing in the public outreach arena to say the least. Take the three-phase water main replacement project the utility is currently in the midst of as an example — negative public feedback has been almost non-existent, says Kelley Dearing-Smith, Louisville Water's vice president of communications and marketing. That's because of the utility's thorough communications efforts. Read more about the utility's recipe for successful public outreach in this set of three online exclusives. mswmag.com/featured



OVERHEARD ONLINE

“Only when you consider the diversity of the population you work with do you have the best chance of solving all the problems you're going to face. You never know where the next great idea is going to come from.”

— *Mentoring Is Mandatory: Developing the Next Generation of Water Professionals*, mswmag.com/featured

A HELPING HAND

Utility Crews Come to One Another's Aid in the Wake of Disaster

When utilities need help in an emergency, systems like the Water/Wastewater Agency Response Network are in place to provide assistance. In late August, Hurricane Harvey hit Texas' Gulf Coast, providing a good example of how this type of system is put into action when the need arises. Read about how two Texas water utilities responded when colleagues victimized by Harvey needed help. mswmag.com/featured



FATBERG

British Utility Discovers 130-Ton FOG Blockage

In 2013, Thames Water in England found a bus-sized lump of fat and wipes in a sewer, at the time one of the largest ever discovered by the utility. It remained an extreme go-to example of what FOG and nonbiodegradable wipes can do to a sewer line. That is, until September when Thames Water discovered a fatberg blocking a 250-meter stretch of London sewer and weighing the equivalent of 11 double-decker buses. mswmag.com/featured



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A LEGACY OF QUALITY AND CONSERVATION

Colorado community's dedication to system improvement and overall water quality earns it Best of the Best honors

By Jim Force

The founders of the Greeley, Colorado, water system would have been mighty proud when the city won the Best of the Best award in the American Water Works Association water-taste competition this year.

That's because water was uppermost in their minds when they settled this area in the late 1800s. "They created a ditch as one of their first projects and provided nonpotable water for irrigation and gardens in the city," explains Burt Knight, Water and Sewer department director.

Then in 1905, Greeley's citizens voted overwhelmingly to go to the mountains for high-quality drinking water. "They purchased property and water rights to the Cache la Poudre River northwest of the city and built the Bellvue Water Treatment Plant at the mouth of the Poudre Canyon," Knight says. The water was piped by gravity 32 miles to Greeley via a wood stave pipeline.

"They were also concerned about good practices," Knight says. "In fact, they restricted watering to certain days of the week."

Infrastructure

Today, Greeley owns a robust portfolio of water rights to the Poudre River as well as the Big Thompson, Colorado, and Laramie rivers. Water is still treated at the 32 mgd Bellvue plant, which was upgraded to its current treatment system in 1946-47 and underwent further improvements in 2007.

While a section of it is on display in the department's offices in Greeley, the old wooden pipeline is long gone, replaced by four transmission

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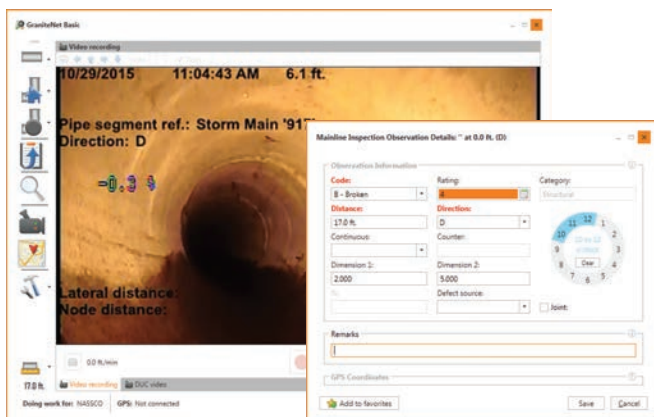
Burt Knight poses with his water treatment crew at the Bellvue Water Treatment Plant at the mouth of the Cache la Poudre River. Knight and the crew are proudly holding the American Water Association trophy for "Best of the Best" water quality. (Photography by Carl Scofield)

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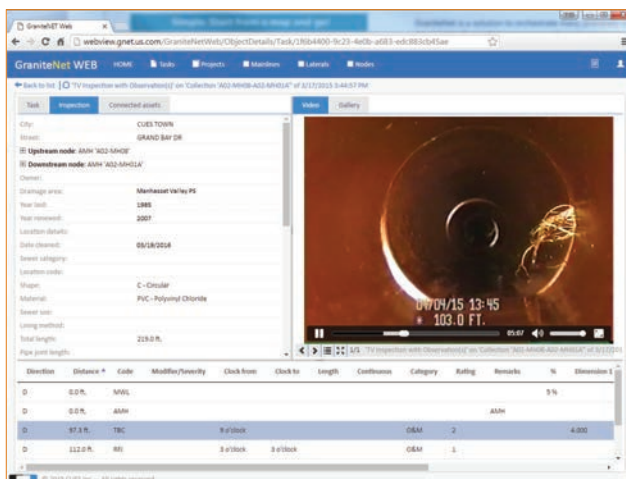
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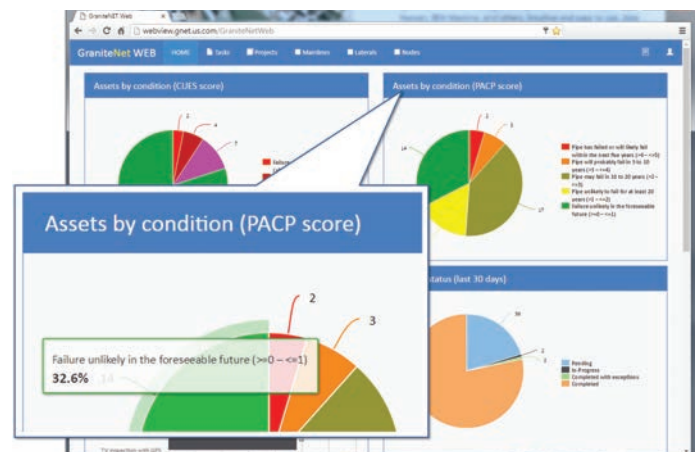


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“Asset management saves us money as it helps us make strategic choices on how to maintain our systems and plan capital improvements.”

Burt Knight

Jesse Bank works with a Correlux leak correlator to detect and locate leaks in a Greeley water main.



lines from the Bellvue Water Treatment Plant and two more from the Boyd Lake Water Treatment Plant 18 miles away that carry water to a series of three treated water storage reservoir complexes and one elevated storage tank in the city. Total treated storage capacity is 69.75 million gallons. Although the long transmission lines make operation and maintenance difficult, treating water closer to the source results in better water quality and lower treatment cost, the utility believes.

The water is then delivered to some 24,000 residential customers through a 457-mile distribution system, consisting of steel, cast iron, ductile iron, and PVC pipe, ranging from 6 to 36 inches in diameter. Age of the pipe dates from the 1890s to the present.

A new Greeley transmission pipeline has just been completed to supplement the existing transmission lines. The new line is 60 inches in diameter, traverses 30 miles, and took nearly 13 years to build.

The Boyd Lake treatment facility in Loveland is rated at 38 mgd and used as a peaking plant during the high-watering season in summer, or as a backup in case the Bellvue plant is down. Source water is drawn from Boyd Lake and Lake Loveland. The plant was built in 1964 and upgraded in 2005.

Meticulous maintenance

Carrying on their heritage of concern about water, Knight's department practices a rigorous

maintenance schedule. Knight explains that the utility previously developed a robust asset management system for its collections network, and the system helped the staff make good decisions on capital improvement projects and point repairs on sewer lines.

With that history, the asset management system was expanded to include the water treatment plants, transmission lines and distribution lines. "Asset management saves us money as it helps us make strategic choices on how to maintain our systems and plan capital improvements," Knight says.

Greeley also conducts proactive maintenance by working with an organized plan — an approach Knight says helps the utility create a vision and look several years into the future.

It helps that Greeley has what they call a "depreciation fund" that allows the utility to take care of necessary repairs and replacements as they are needed rather than having to compete with other capital projects from a budget standpoint.

"We're able to ask for what we need and get it done," Knight says.

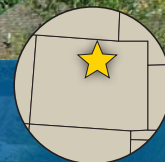
He says the fund is supported by a portion of the rates Greeley charges customers, but even with that charge, the city's rates rank about in the middle of rates charged by comparably sized cities.

Pipe lining

With some of the iron pipes dating back decades, Greeley has fought corrosion by using a cement mortar-lining technique on its cast iron

PROFILE:

**Greeley, Colorado,
Water and Sewer Department**



FOUNDED:

As a Union colony in 1869, and as the city of Greeley in 1886

POPULATION SERVED:

135,000

AREA SERVED:

City of Greeley; city of Evans; and towns of Milliken, Windsor and Garden City

SOURCE WATER:

Cache la Poudre, Big Thompson, Colorado and Laramie rivers

INFRASTRUCTURE:

Two water treatment plants, 32- and 18-mile transmission lines, 426 miles of water distribution lines, two pump stations, 69.75 million gallons of treated water storage

STAFF:

Burt Knight, director; Bob Neal, operations manager; Adam Prior, chief engineer; Paul Tucker, superintendent of transmission, distribution and collections; Andrew Kabot, water treatment manager; Randy Mitchell, water plant superintendent; John Thornhill, water resources operations manager

AWARDS:

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OPERATIONS BUDGET:

\$17 million for water, and \$6 million for sewer

WEBSITE:

www.greeleygov.com

and ductile iron lines. The main objective is to remove rust and provide a pipe wall that will last long into the future.

Greeley has lined about 4 miles of pipe a year and has completed a total of 81 miles of pipe, all of which was originally installed before 1950 with no corrosion protection.

In the process, a rotating blade, matched to the inside diameter of the pipe, is pulled through the pipe to scour rust off the pipe walls. "It's similar to pigging a sewer line, and it's about half the cost of replacing the pipe," Knight says.

Following rust removal, a rotating spray head is drawn through the pipe, applying a coat of cement to the inside pipe wall. A smoothing device tracks behind the sprayer to assure a smooth pipe surface.

Knight says one of the city's engineers, Dan Moore, was responsible for suggesting the

(continued)

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Members of the Greeley water crew lower and place a new pressure release valve in an existing vault.



Cooperation between the Greeley water conservation project and a local homeowners association led to the development of this bioswale through an open space in a residential area.

approach and bringing the technology to the utility. “Not only has it saved us money,” Knight says, “it’s extended the life of our existing pipelines by up to 50 years. It’s much less expensive and disruptive than pipe replacement.”

He says the cement-lining project has improved water quality, improved the flow and pressures, and added more capacity for firefighting in the rehabilitated pipes.

Fixing leaks

Greeley has been aggressive about detecting and fixing leaks. “We inspect about 100 miles of the system every year,” Knight says, meaning the entire system is reviewed every five years. Using the water department’s distribution system plat book, a specific area is mapped out. An LD-12 listening device from Pollardwater locates areas where leaks exist. “The leak is then repaired and has helped us keep our losses from leaks at around

5 percent,” Knight says. That’s well below the national average of 15-16 percent.

For the transmission pipe system, the utility is beginning to employ a SmartBall and Free Swimmer (Pure Technologies US) acoustical device to pinpoint exact leak locations and analyze pipe wall defects. The SmartBall is capable of locating leaks and air pockets in waterlines and can find leaks as small as 0.3 gallons per minute. Free Swimmer records the wall structure of the existing pipe, identifying areas that corrosion has reduced the thickness.

“The SmartBall was new this year,” Knight says. “The utility is always looking for ways to reduce loss.”

People issues

Greeley works just as hard on “softer” planning and staffing issues as it does on pipes and valves.

“We completed our water master plan in

2003,” Knight says. “It is a forecast of what facilities we need to improve and establishes how we will accomplish our work as we go forward.”

The plan highlights four guiding principles Greeley strives for: expanding raw water storage, strengthening infrastructure through maintenance and redundancy, continuing water acquisition, and improving conservation.

“That’s the four-point plan for our water system,” Knight says.

Staffing is a critical part of any utility plan, and Greeley has paid attention to the details.

“We’ve combined some of our service divisions — water transmission and distribution, and wastewater collections — into a single service group,” Knight says. That provides a larger labor force and cross-training across the utility. Plus, it benefits employees in that they learn about bigger systems and have more opportunity for advancement. “It’s all one now,” he says. “We get better efficiency (by combining these groups) and can cover gaps if someone leaves or when responding to larger emergencies.”

Retirement planning

Retirement is another issue Greeley takes seriously. “Like everybody else, we have an aging work-

BUDGETING WATER CONSERVATION

Like most Western cities, Greeley, Colorado, has a comprehensive water conservation plan. In fact, according to John Thornhill, water resources operations manager, the city has been practicing water conservation since 1907, when the community’s early settlers limited watering to certain days of the week and enacted time-of-day restrictions.

But today, the plan has a new program. It’s called the Water Budget, and the city implemented it just last February as a way to reward customers for using no more water than they need.

“It’s patterned after a program launched by the Irvine Ranch Water District in California some years ago,” Thornhill says. “But it’s tailored to our needs.”

The program uses the number of people in a family and the size of the yard on the property to establish an optimum amount of water needed by each individual customer each month.

Customers staying within that limit pay the lowest water rate. Customers using more than the optimum amount fall into the “Inefficient Use” category and pay a higher rate. Above that, there are “Excessive Use” and “Unsustainable Use” rates for accounts consuming much more water than necessary.

Water Budget is unique for each of the system’s 24,000 residential

customers, and customers can go online to see their water usage on a real-time basis.

The program differs from others in that the usage levels and rates change with the weather. In dry conditions, the Water Budget is more generous; in wet weather, the water budget will be lower.

Thornhill says marketing has helped the program get off to a good start. “We began talking about the Water Budget in our billing statements four years prior to its start,” he says. In addition, he estimates the city made between 40 and 50 presentations on the program.

While the Water Budget doesn’t apply to commercial accounts, those users pay a basic raw water surcharge and are charged more if they use more than the amount of water dedicated during development.

Overall, Greeley has reduced water consumption by more than 20 percent through a variety of conservation measures. The city offers a showerhead exchange, toilet rebates, and rebates for water-smart landscaping and irrigation practices.

“In reality, places with limited water supplies have to be as efficient as possible, plus the state mandates water conservation,” Thornhill says. Now, following in the footsteps of the community’s founders, Greeley plans to become even more water efficient through its new Water Budget program.

For more information on Greeley’s water budget, visit: www.encyclopedia.com.

force,” Knight says, noting that some employees in supervisory positions have 20 to 30 years’ experience.

“It’s an issue I hold close,” he says. “We need a system that will extract some of that key knowledge and retain it for future employees.”

He says some employees may think that newcomers can learn on the job just the way they did, but that’s impractical today and carries too much risk. “We need to collect their knowledge and capture it in a digital form that will give new employees tools to enable them to retrieve the information.

“In the fall when the regional competition occurred, it’s more settled water, and in the spring, we have the spring runoff source used for the national award. It takes a lot of talent by our operators to deal with both and produce a consistent, award-winning product at the end of the day.”

Burt Knight

“We’re trying to put as much information into the system as we can — some audio, some video, SOPs — and put the information in a location where everybody can find it,” he adds. Utilities need to capture why things are the way they are, Knight says, “without having to figure it out each time.”

Knowledge capture goes hand in hand with succession planning, another activity getting Knight’s attention these days. One approach, he says, is to get a new employee on board before the person they are replacing leaves. Another is to hire some key retirees back in part-time roles. “We have been able to still get some valuable time with these employees by relieving them of supervisory responsibilities and foregoing the regimented five-day-a-week schedule. This allows us to give them different work assignments and still have them available to convey technical information to the other staff.”

One of the most important pieces of information to be passed along is the effort needed to produce water that meets Greeley’s quality standards, recently recognized by AWWA as Best of the Best.

Knight recalls winning the AWWA regional contest for best-tasting tap water in 2016 and besting 33 other contestants in Philadelphia before winning the grand prize this year. It’s not easy to win that honor. “We had two different types of source water,” Knight says. “In the fall when the regional competition occurred, it’s more settled water, and in the spring, we have the spring runoff source used for the national award. It takes a lot of talent by our operators to deal with both and produce a consistent, award-winning prod-

uct at the end of the day.” Knight notes that one judge said the Greeley water was “refreshing” and “made me want to drink more.”

In Philadelphia, there was another contest at the AWWA conference called the People’s Choice that was open to numerous water providers and that Greeley also won. “It’s sort like a chili cook-off with attendees voting on the water,” Knight says. This was the first time a water provider won both contests.

“Winning it again is going to be tough,” Knight says. But he believes his staff is top-notch and gives a nod to the city’s founders who more than

a century ago sought high-quality water in the mountains above Greeley. ♦

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GET YOUR WHOLE TEAM INVOLVED

Use these four points of emphasis to build a strong culture of teamwork in your utility

By John Hendershot

Have you ever noticed that the teams with superstars are not necessarily the ones that win championships? There is something more valuable than superstar ability or taking the shot every time you get the ball. We have all witnessed a tier-two sports team upset a top-ranked, top-talent team, and we scratch our heads asking, “How in the world did that happen?”

Most sports fans have heard of the famed basketball player Earvin “Magic” Johnson. Magic was so good in high school that his coach would tell him to take the shot every time he got the ball. Even though they would win big, Magic could see the faces of the parents who came to watch their sons play the game and the disappointment in it. At one point, he decided to make a huge change in the way he played the game.

Magic decided to positively affect the play of everyone on his team by raising their game and acting more like a team to work together for a common goal. He began passing the ball, and he did it so well that he still holds the NBA career record for assists at 11.2 per game. Arguably Magic Johnson is one of the greatest players to ever play the game of basketball, and he did that by making everyone around him better — not by taking the shot every time he got the ball.

A great team doesn’t require the superstar to take the shot every time, but what it does require is that everyone work collectively for a common goal with a set game plan. Good organizations realize that they are not competing with like organizations in their industry, but instead competing with themselves. Good leaders shouldn’t worry about what the “competition” is doing today, but instead focus on their team and making a positive impact.

The million-dollar question is how do we make our teams better and not focus on the competition? What steps are necessary in beginning to understand and implement this process?

1. **Humble yourself, and admit that you don’t have all of the answers.** In doing so, you allow yourself to see that you most likely already have team members who possess different strengths than you do. Surround yourself with them. Don’t work independently on projects, but rather start to have discussions with your team because I am certain there will be a lot of valuable input they bring to the organization.

A great team doesn’t require the superstar to take the shot every time, but what it does require is that everyone work collectively for a common goal with a set game plan.

2. **Provide educational and training opportunities to your team members.** None of us have the capability to grow if we don’t invest in a conscious decision to do so. In an effort to spur on development within your team, you have to encourage and present the challenge to your team members to learn new skills. I know that training and development can be expensive, but if you don’t invest in your team members and encourage them to grow, they are going to cost you more money in the long run.
3. **Surround yourself with the right team.** Spend a lot of time defining the characteristics you want your leadership team to have. In doing so, make sure that you don’t compromise on what you deem to be important (humility, empathy, drive, growth, integrity, etc.).
4. **The right kind of communication.** Life is busy. Work is busy. But, we have to understand that if we don’t take the time to ensure that we are effectively sharing information throughout our organization, we could be stifling morale and production. Where there is a void in communication, people tend to make up answers and assume things. If we are not communicating effectively, it isn’t just our problem — it’s everyone’s problem. Knowledge is power. You’d never give the play you’re running to the quarterback and receiver but leave the other nine players out of the loop. That would handicap your offense and set your team up for failure. Unfortunately, that is exactly what a lot of managers do and precisely why a lot of them fail.

There are a number of other things that leaders can do to increase teamwork, but these four points are paramount in beginning the journey.

Remember that you are not alone in this process. Every great leader must go through stages of unlearning in order to discern how to step away from myths that we have been taught about leadership and teach ourselves how to serve our team in a way that brings everyone together toward a collective vision.♦

About the Author

John Hendershot is the CEO of DIG-IT INC., a utility and telecommunications construction contracting company, and the president of the Great Lakes Trenchless Association.

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.

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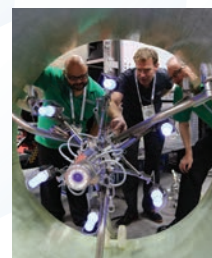
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A REFINED APPROACH TO SEWER REHAB

City's partnership with oil company opens a path for complicated sewer line rehabilitation project without compromising production schedule

By Peter Kenter



Ponca City Environmental Services Director Hong Fu (left) and Darwin Haney, utility maintenance supervisor, in front of City Hall in Ponca City, Oklahoma. (Photography by Brett Rojo)

The Ponca City (Oklahoma) Environmental Services Department is well-versed in wastewater issues, but working in an oil refinery stretched its comfort zone.

Ponca City is a community of 26,000 built on the fortunes of the oil industry. While its economy continues to diversify, many of its citizens work to refine crude oil. When a 100-year-old sanitary sewer main passing through the center of the Phillips 66 Ponca City refinery complex showed signs of failure, the city leveraged a unique partnership with this industrial customer to solve the issue.

“City management and staff always considered the project to be a major challenge. We realized straight off that only a collaboration between the city and the refinery would make the project a reality.”

Hong Fu

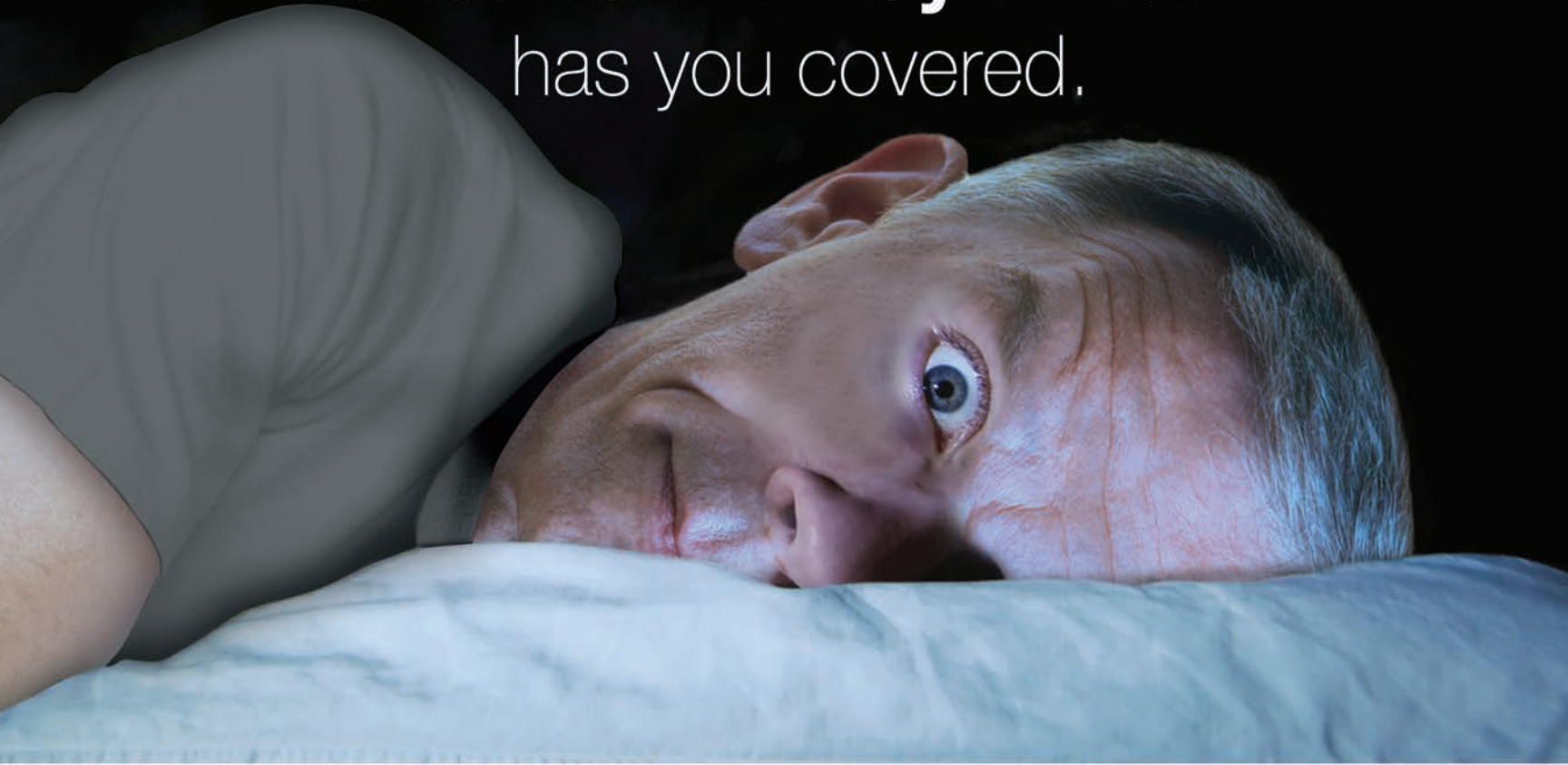
Ponca City is located at the midpoint of three larger cities: Oklahoma City; Tulsa, Oklahoma; and Wichita, Kansas. The city's Environmental Services Department is responsible for all aspects of municipal wastewater and water operations, as well as solid waste collection, recycling and landfill operations.

The city is located on a predominantly flat drainage basin. The wastewater collections system is composed of 12 sewage-pumping facilities and 177 miles of pipe, ranging from 6 to 30 inches in diameter. The pipes are made of a wide range of materials, from PVC and clay to ductile iron and concrete. PVC is the material of choice for all new construction.

(continued)

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Maintenance workers Marc Smith (left) and Rick Jones keep an eye down the manhole while cleaning a sewer main with a Vac-Con combination truck.

PROFILE: Environmental Services Department, Ponca City, Oklahoma

YEAR ESTABLISHED:
Circa 1920

CUSTOMERS:
11,400

SERVICE AREA:
100 square miles

DEPARTMENT STAFF:
82 full time
(47 in water and wastewater)

CURRENT INFRASTRUCTURE:
Sewer — 177 miles; water — 223 miles

ANNUAL OPERATING BUDGET:
Sewer — \$2.5 million;
water — \$3.6 million

ASSOCIATIONS:
American Public Works Association,
Water Environment Federation, Solid
Waste Association of North America

WEBSITE:
www.poncacityok.gov

“We had to learn each other’s businesses. They didn’t know anything about the sewer business, and we didn’t know anything about oil refining.”

Darwin Haney

“All wastewater system components are in good to fair condition,” says Hong Fu, Ph.D., director of the city’s Environmental Services Department. “Like most utilities, our greatest challenges involve the age of the system. Portions of the system are almost 90 years old and provide inadequate capacity. Over the past 10 years, we’ve invested \$8 million in capital improvement projects to systematically improve the capacity and structural integrity of the system.”

The city also works to battle tree roots, which invade sewer pipes. The department currently uses a professional root control company, which employs a chemical treatment to keep roots at bay.

Relying on staff

In-house crews tackle smaller-scale projects, including leak repairs. They handle smaller construction jobs, as well, usually projects involving less than 100 feet of shallowly buried, small-diameter

pipes. Larger projects are completed by outside contractors, through a competitive bidding process.

The department’s equipment fleet includes two flusher trucks (a 2004 Vactor Mfg. jetter truck and 2014 Vactor Mfg. combo unit) and a camera van equipped with an R.S. Technical Services Inc. (RST) sewer camera system and POSM (Pipeline Observation System Management) software.

The entire wastewater service area is divided into 20 sections. A two-person city crew flushes the system on a 2 1/2- to three-year cycle, moving from one section to the next until reaching the end and starting over.

The department uses Lucity software for water and wastewater work orders, invoices and inventory tasks. In the field, workers utilize ArcGIS for mobile mapping, water main break tracking, new waterline installation, valve replacement, sewer line flushing, root control, manhole rehabilitation and unpermitted discharges. The system is currently about 80 percent GIS mapped.

The department prides itself on keeping the city’s wastewater system in good repair. However, one particular length of sewer pipe proved less simple to maintain: a city-owned sewer interceptor that enters the Phillips 66 refinery from the north and exits to the east.

An important interceptor

“This interceptor is an important component in the city’s wastewater collections system,” says Fu. “It serves a fully-developed drainage basin of 570 acres in the southwest part of town.”

During a major rainfall May 19, 2005, the sewer surcharged, causing stormwater mixed with a small volume of hydrocarbons and wastewater to overflow from three manholes.

In response, Phillips 66 retained the engineering firm of Burns & McDonnell to investigate the sanitary sewer system within the boundaries of the refinery. Exactly what caused the hydrocarbons to enter the mix remains a mystery. The Burns & McDonnell report submitted in 2006 revealed no evidence of cross connection between the city’s sanitary sewer and the refinery’s oily wastewater by either CCTV inspection, dye testing or smoke testing.

“However, the investigation identified significant structural and hydraulic deficiencies in the city’s sanitary sewer interceptor, such as cracks, offset joints, missing pipe segments and an undersized section,” Fu says. “We realized we needed to address these deficiencies within a reasonable time frame to avoid future unpermitted sewer discharges.”

The original interceptor was installed almost a century ago, before the refinery was built. In

(continued)



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“The most memorable part of the job was simply finishing everything we’d set out to do on time.”

Darwin Haney

all, the section measured about 6,900 feet of clay pipe, ranging from 12 to 24 inches in diameter.

Refinery expansion

As the refinery expanded, it installed multiple pieces of equipment and its own refinery wastewater pipes over the top of the existing sewer. The challenge: replacing or rehabilitating the pipe in the middle of an active refinery under extreme space constraints and without compromising the industrial system schedule.

MEANWHILE, BACK AT THE REFINERY



After completing a challenging pipe rehabilitation project on the premises of the Phillips 66 Ponca City refinery in 2015, Ponca City, Oklahoma, is currently in the design phase of another major sanitary sewer interceptor rehab project at the facility.

The length of the section to be replaced measures approximately 10,000 feet and represents pipe diameters of 18, 24 and 27 inches.

“The concrete pipe was constructed in 1971 and 1972 and has suffered erosion problems due to acid corrosion,” says Hong Fu, Ph.D., director of the city’s Environmental Services Department. “The project starts at a manhole outside the west gate of the Ponca City refinery’s south tank farm, goes east across the tank farm and Highway 60, and ends at the creek crossing west of the Ponca City wastewater treatment plant.”

Slated to begin construction in 2018, Fu says this project has the city breathing a little easier: “The pipe isn’t located under any active refinery processing units. That makes life a bit easier.”

“City management and staff always considered the project to be a major challenge,” Fu says. “We realized straight off that only a collaboration between the city and the refinery would make the project a reality. Phillips 66 was on board with the project from the start and was committed to making it happen in 2015.”

The department met frequently with refinery staff and made multiple site visits to develop a plan of attack.

“We had to learn each other’s businesses,” says Darwin Haney, water utilities superintendent with the city, who acted as construction inspector on the project. “They didn’t know anything about the sewer business, and we didn’t know anything about oil refining.”

Doing it trenchless

The partners chose a trenchless approach using two methods. Pipe bursting was the preferred method to avoid digging through existing refinery piping. Cured-in-place pipe rehabilitation would be used wherever space constraints prevented pipe bursting. Original pipe would be replaced with new PVC with diameters of 12, 16 and 20 inches.

The project was designed by Cabiness Engineering. Urban Contractors of Oklahoma City was awarded the construction contract and did the pipe bursting using equipment from TT Technologies. CIPP work was performed by Insituform Technologies as a subcontractor to Urban Contractors.

“City infrastructure projects and refining operation have very different safety standards,” says Haney. “Construction workers on site were required to wear Nomex clothing, and the site was under constant hydrogen sulfide monitoring.”

The refinery provided all safety training for construction crews and offered a full-time safety officer at its own expense to ensure the construction process would be compliant with refinery regulations.

“The refinery even hired a contractor experienced in refinery construction to dig entry and exit pits for pipe bursting so the holes would be ready when the rehabilitation process started,” Fu says.

The original CCTV inspection indicated extensive infiltration under one of the refinery’s stormwater ponds.

“We knew the pond had to be drained to reduce the water pressure on the pipe in order to proceed with pipe bursting,” Fu says. “To everybody’s surprise, draining the pond revealed two out-of-service manholes covered with concrete caps that needed to be eliminated as well as an additional 8-inch sewer main that needed to be rehabilitated.”

Concrete solutions

In many cases, pipes were encased in concrete, in all likelihood to protect them as the refinery expanded. That made pipe bursting more challenging.

“The extreme case was a block of concrete that protruded inside a pipe,” Fu says. “That

The Ponca City Environmental Services team includes (from left) utility maintenance supervisor Darwin Haney, senior maintenance worker Dee Jones, and maintenance workers Marc Smith, Will Giebel and Rick Jones.



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Will Giebel operates a CUES camera controller with POSM video software while inspecting a sewer line.

required a water-jet-powered saw and four days of cutting to remove."

CIPP was used underneath a railroad line and in areas where bends in the pipe were too extreme for bursting.

Haney notes that at a refinery, each part of a construction project must be separately permitted each day, and only one permit is issued to a contractor at a time.

"If you're pipe bursting in one location and

want to start manhole rehabilitation in another, you couldn't get two permits for two locations," he says. "As we learned to trust each other, the refinery got to the point where they gave a little and we could work in multiple locations. Mike Paige at Phillips was very instrumental in getting the permits for the project. I also worked very closely with Dale O'Neill, my rep at Phillips. By the end of the project, working day in and day out, we were like brothers."

The entire project was completed safely in four months while refinery operations continued 24/7.

"The most memorable part of the job was simply finishing everything we'd set out to do on time," Haney says.

While the original contract was valued at \$1.47 million, change orders and pipe diameters differing from the expected size both added and subtracted from the total cost. In all, the project was completed for \$1.67 million. The project was honored with the 2014 National Recognition Award by the American Council of Engineering Companies and the 2015 American Public Works Association-Oklahoma Project of the Year Award.

The refinery's participation not only ensured a smooth and safe construction process, but also resulted in significant cost savings for Ponca City.

"I want to give them full credit," Fu says. "As part of our community, they really helped us to make the project successful, and the partnership helped to make the job more economical for taxpayers." ♦

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ELIMINATING HYDROEXCAVATION HAZARDS

Bonding mats can help prevent electric shocks when working near charged utility lines

By Sherree Geyer

Badger Daylighting Corp. crews know the dangers of working near utility lines firsthand, and thankfully they were using bonding mats.

"We've had tires that were damaged because they took current, and the employees were safe because they were on the mat," says Dave LaFleur, corporate health, safety and environmental director for Badger Daylighting Corp., a North American provider of hydroexcavation services. "When hooked up properly, the employees are safe from voltage."

Bonding (or grounding) mats provide an insulated electrical safety mat that, when laid on the ground, protects workers. The National Institute for Occupational Safety and Health in Washington, D.C., also says the nonconductive safety mats prevent individuals from being a path for electrical current to the ground.

"Bonding mats create an equipotential, or equal potential, area to protect the operator in the event that water cuts through an energized power cable," says Dean Krossa, president of Kri-Tech Products Ltd., a manufacturer of bonding mats. "If the water stream cuts through energized cable, the wand would become energized."

Prevention

Bonding mats help prevent underground land strike injuries and deaths, according to the results of a six-month review of hydroexcavation electrical occurrences by Kri-Tech Products. Incidents involving gas line or power pole digs without the use of bonding mats resulted in hospitalization or death, the 2012 review found.

Krossa calls bonding mats an effective way to reduce exposure to electrical burns and fatal electrocution. Workers who excavate near underground cables or waterlines do risk electrocution, he says.

Bonding mats come in standard configurations, usually 58 inches square or 120 inches square. Custom configurations are also available.

"Mats are bonded to the lance and dig tubes, keeping the operator at equal potential and safe," says Wes Scott, director of consulting for the National Safety Council.

Proper care

Mats should be pressure washed, dried and rolled for storage, states Kri-Tech Products' care and maintenance guide. It also states the ferrules and clamps should be wire brushed before and after use "to keep connections clean and corrosion free."

"We've had tires that were damaged because they took current, and the employees were safe because they were on the mat. When hooked up properly, the employees are safe from voltage."

— Dave LaFleur

Repeatedly folding or rolling the mats in the same pattern can put stress on the embedded wire grid. The mats, and all associated conductive material, should be visually inspected before each use for damage, adds the guide, which calls "normal signs of wear acceptable" but "punctured, severed or missing braid elements unacceptable." Those that don't pass muster should be "tagged out and removed from service immediately."

The guide adds that bonding mats should undergo digital low-resistance ohmmeter testing every three months or at prescribed intervals based on frequency of use. Those with measured resistance values outside acceptable ranges should be tagged out and removed from service.

Beyond the mats

To protect themselves, Scott suggests hydroexcavation workers check out the National Safety Council's best practices.

He says cables should be de-energized if possible, and breakers should be hot-line tagged so they trip faster at lower fault currents. Operators also need to have a heightened awareness, skill, training, and knowledge of the limits on water pressure and temperature. Scott also suggests putting protective urethane covers on the water lance and dig tubes.

Personal protective equipment, such as omega-rated boots and footwear, can protect workers. "Footwear outsole can provide a secondary source of electrical hazard protection," Krossa says.

LaFleur advises workers "to follow company job procedures as they relate to grounding and bonding" to protect themselves from hydro-electrical shock or electrocution. He points out that "digging at appropriate water pressure eliminates damage to underground infrastructure." ♦

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	VM4007H	8"	4000	7	690cc Honda				X	400'X3/8"	YES	
	VM2712H	10"	2700	11.5	690cc Honda				X	400'X1/2"	YES	
	TM4012K	10"	4000	12	999cc Kohler					400'X1/2"	YES	
	CS400QB.4	6"	4000	4	16hp 479cc Briggs Vanguard	X				200'X3/8"	YES	YES
Electric Eel Mfg., Co., Inc. 501 W. Leffel Ln., Springfield, OH 45506 800-833-1212 • 937-323-4644 • F: 937-323-3767 msperanza@electriceel.com www.electriceel.com	EJ-1500	4"	1500	1.7	1 1/2 hp	X	X			150'X1/4"		
	EJ-3000	8"	3000	4.7	13 hp		X			300'		
 General Pipe Cleaners 1101 Thompson Ave., McKees Rocks, PA 15136-3818 800-245-6200 • 412-771-6300 info@drainbrain.com www.drainbrain.com	JM-1000	3"	1500	1.4	1.2hp	X						
	JM-1450	4"	1500	1.7	1.5hp		X			150'X1/4"		
	JM-2900	8"	3000	4	13hp		X			200'X3/8"		
	JM-3055	8"	3000	5.5	16hp		X			300'X3/8"		
	JM-3080	8"	3000	8	20hp		X			300'X3/8"		
	JM-2512 Typhoon	10"	2500	12	27hp					400'X1/2"		
 Pipeline Renewal Technologies 111-B3 Canfield Ave., Randolph, NJ 07869 866-936-8476 • 973-252-6700 • F: 973-252-1176 mail@pipelinert.com www.pipelinert.com See ad page 17	CleanSteer	2"-12"	1800-2000	18-20	Jet truck/trailer		X			200'		NO
 SPARTAN SINCE 1943 Spartan Tool 1506 West Division St., Mendota, IL 61342 800-435-3866 sales@spartantool.com www.spartantool.com	717/727	1 1/4"-6"	1,500/3,000	2.2/4	Electric/Gasoline		X			115'/200'	NO	
	738/758	3" - 12"	2,000/3,000	12	Gasoline			X	X	250'/350'		NO
	Soldier	3" - 12"	3,000	12	Gasoline			X	X	350'	NO	
	Warrior/Ultimate Warrior	3" - 24"	4,000	18	Turbo Diesel			X		500'	NO	
	Urban/Ultimate Urban Warriors		3,000/4,100	19/21	Gas and Diesel				X	460'/520'		NO
 Super Products <small>TRUCK MOUNTED VACUUM EQUIPMENT</small> Super Products LLC 1700 W. Cleveland Ave., New Berlin, WI 53151 800-837-9711 • 262-784-7100 info@superproductsllc.com www.superproductsllc.com See ad pages 7, 47	SuperJet Truck Mounted Jetter	96"	3000	100	Cummings ISL 325				X	1000' of 1" dia hose	YES	



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						CARRY	PUSH/PULL	TOW	MOUNTED			
Water Cannon, Inc. – MWBE 4300 W Lake Mary Blvd #1010-424 Lake Mary, FL 32746 800-333-9274 • F: 888-928-9274 sales@watercannon.com www.watercannon.com See ad page 57	15J84	3"	1500	2	2hp 115V Electric	X				None	NO	
	15J51	6"	4200	4	Honda GX390		X			150'X3/8"	NO	
	15J41	6"	4200	4	Honda GX390		X			250'X3/8"	NO	
	17HJ45	8"	4000	5.5	Honda GX630		X			350'X3/8"	NO	
	16T57	10"	3000	10	Kohler 27hp			X		350'X1/2"	NO	

JETTER DISTRIBUTORS	DISTRIBUTER BRANDS
MTech 7401 First Place, Cleveland, OH 44146 800-362-0240 • 440-646-0996 • F: 440-646-9953 sales@mttechcompany.com www.mtechcompany.com See ad page 57	PipeHunter, Dynavac
Water Cannon Inc. 4300 W Lake Mary Blvd #1010-424, Lake Mary, FL 32746 Toll Free - 800-333-9274 sales@watercannon.com www.watercannon.com See ad page 57	Water Cannon, Delco, Simpson

CABLE MACHINE MANUFACTURER	MODEL	DRUM CAPACITY	PIPE DIAMETER
 SPARTAN <small>SINCE 1940</small> Spartan Tool 1506 West Division St., Mendota, IL 61342 800-435-3866 sales@spartantool.com www.spartantool.com	81	50'	1 1/4" - 3"
	100	75'	1 1/4" - 4"
	300	107'	3" - 6"
	1065	250'	3" - 10"
	2001	300'	3" - 10"

CABLE MACHINE DISTRIBUTOR	DISTRIBUTER BRANDS
MTech 7401 First Place, Cleveland, OH 44146 800-362-0240 • 440-646-0996 • F: 440-646-9953 sales@mttechcompany.com www.mtechcompany.com See ad page 57	RIDGID

KEEPING UP WITH NASHVILLE

Transmission main project adds resiliency to and upgrades water system in the face of site challenges and time constraints

By Jared Raney

In the Nashville, Tennessee, airport district, construction of any kind is difficult, let alone installing 5 miles of large-diameter transmission main under two state highways on a tight timeline.

The project included six months of preparatory public outreach, carefully orchestrated construction, and 24/7 work schedules to minimize traffic disruption and inconvenience to customers and local businesses.

A complex system

Metro Water Services is centered in Nashville, but it also serves most of Davidson County and portions of surrounding counties. Over the years, it has incorporated several smaller utilities, including the Cumberland district — the main focus of this transmission water main

“We can have a bottleneck in the distribution system and not have it in the treatment plant, so we’ve got to make sure that not only the treatment plant can treat the future growth and send it out from its high-service pumps, but that the distribution system, reservoirs and pumping stations can handle it as well.”

Cyrus Toosi

project. The new water main will provide redundancy and additional capacity in that area.

The utility operates two water treatment plants: K.R. Harrington, the newest plant built in the 1970s, and Omohundro, which dates


back to the late 1800s. The distribution system, which serves 198,000 customers, includes 3,000 miles of pressurized water mains, 43 reservoirs, 56 pump stations, and, 20,855 fire hydrants.

Most of the original water system was built with cast iron pipe. Due to nonaggressive soils, it has in most cases lasted well past its expected lifespan. The original treatment plant from 1889 is still online, and much of the pipe predates even that.

For new projects, the utility is using ductile iron, which provides the durability of cast iron with additional corrosion protection, as well as higher pressure and surge ratings.

“They’re ductile in the sense that they can take some subsurface movement and the joints can take some deflection. It’s more forgiving when the ground moves, and also, the pressure

(continued)



Nashville faced several site challenges on its 5-mile transmission main project, including this crossing of the Cumberland River. Godwin dewatering pumps were used to provide a dry work area during the crossing. (Photography courtesy of Garney Construction)

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“The master plan is ongoing — it’s always updated, it’s always tweaked — because one thing about population projection is it doesn’t always happen exactly as projected.”

Cyrus Toosi

rating on the pipes are pretty high,” says Cyrus Toosi, P.E., assistant director and chief engineer of Metro Water Services. “We have basically stuck with ductile iron pipe for our water distribution system.

“I don’t know of any situation — and I’ve been with the utility now for 27 years — that we’ve had a natural break of a ductile iron pipe.”



The master plan

The transmission main project is just one part of the water utility’s master growth plan and is a result of a distribution-system optimization analysis, which found need for added resiliency and redundancy.

“As Nashville grows, we cannot wait until we realize that growth, so we work with the city’s planning commission and metro planning organization, and forecast growth and demands,” Toosi says.

“We have hydraulic models. It says if this area is going to realize a 30 percent growth in the next 10 years, what does that do to flows and pressures in the system?” Toosi says. “We can have a bottleneck in the distribution system and not have it in the treatment plant, so we’ve got to make sure that not only the treatment plant can treat the future growth and send it out from its high-service pumps, but that the distribution system, reservoirs and pumping stations can handle it as well.”

Through further analysis, the utility determined that the best, most efficient route for the new transmission main would run underneath parts of two major roadways.

“These are state highways. The Tennessee Department of Transportation made sure we did a routing study, so we looked at costs, maintenance, and then ultimately water quality,” Toosi says. “The current route was the best solution considering all the factors.”

The water main project came more than a decade after it was added to the master plan and capital improvements budget. Originally, it was slotted as a 24-inch line addition, but after the project was delayed due to more pressing system work, they realized there was a bigger need for a large-diameter redundancy main from the K.R. Harrington plant.

“Part of the reason originally for doing the 24-inch line — that later got combined into this

PROFILE:

**Metro Water Services,
Davidson County, Tennessee**

POPULATION:
680,000

YEAR ESTABLISHED:
1963 with the consolidation of a metro government, combining city and county services

CUSTOMERS:
190,000 water accounts

INFRASTRUCTURE:
3,000 miles of water main, 180 mgd capacity

ANNUAL BUDGET:
\$130 million

EMPLOYEES:
759 including water, storm and sewer

WEBSITE:
www.nashville.gov/water-services

bigger project — was to have an alternative feed into the Cumberland area but also as a reverse alternative feed back to our main distribution system,” Toosi says.

Essentially, they were looking to provide backup distribution capacity going both ways — toward the Cumberland (or east side area) and in return to the main distribution system and the K.R. Harrington plant.

A portion of the existing system is made of 60-inch prestressed concrete cylinder pipe with a history of failures. A recent break in the main disrupted service for customers in the area was a driving factor in changing the project to its current framework.

(continued)



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Much of the city's original water system was built of cast iron, which has outlived its expected lifespan. Ductile iron is being used on the transmission main project.

They expanded the original 24-inch-diameter segment to 36 inch and added a 60-inch line. Despite increased construction, utility officials are glad they waited.

NO SUGARCOATING

As part of the expansive public outreach conducted by Metro Water Services, a little creativity went a long way in showing citizens what the project would entail.

"We talk about water projects and people are like, 'Oh yeah, I've seen water projects before; OK, so they're going to put a waterline in here,'" says Sonia Allman, manager of strategic communications for Metro Water Services. "Very few people have ever seen a 60-inch water main, and they have a hard time visualizing what that looks like and the construction associated with it."

So the utility found a creative way to demonstrate what it meant to embark on such a large project with a somewhat paradoxical makeover of a construction material.

"One thing we did very different with this project is we actually had a piece of 60-inch pipe decorated like a candy cane in the Donelson Hermitage Christmas Parade," Allman says. "We didn't want to sugarcoat (the project). It is going to be major construction. There are going to be headaches. There are going to be traffic issues. ... Being in the Christmas parade, people knew what we were doing, why we were doing it, and what that process looks like."

"In hindsight, having delayed the original project actually saved us some money in being able to build both projects together," Toosi says. "The master plan is ongoing — it's always updated, it's always tweaked — because one thing about population projection is it doesn't always happen exactly as projected."

Working nonstop

Pressure from the Tennessee Department of Transportation and the potential for public impact complicated the project's execution. As a result, the utility set an ambitious goal: Complete the 5-mile project in less than a year.

Much of the burden of completing the project on that tight timeline fell on contractor Garney Construction.

"The original goal was for them to work 24/7: the Tennessee Department of Transportation wanted us in and out as fast as we could," Toosi says.

Unfortunately, that didn't work out entirely as planned. The project segment on Elm Hill Pike, the only nonhighway portion, presented problems. The area is a popular location for hotels, and neither management nor their guests were thrilled with major construction occurring outside their doors all through the night.

"We had to relax a little bit from that schedule. ... People in the hotel were having issues with that, so we relaxed it a little bit there."

Time, however, remains of the essence. Nearly 4 of the 5 miles of pipe will run next to or directly underneath state highways — for most of the 60 inch and all of the 36 inch. It will tie into a pre-existing 60-inch pipe on the south end, and extend east for about 1 mile along Elm Hill Pike before turning to follow Highway 255. North another mile or so, it transitions into 36-inch main, following Highway 70 for 2 1/2 miles.

In many cases, the project will involve tearing

up two lanes of the four-lane highways. Traffic control and coordination is a big challenge, and so far, Metro Water Services officials say the contractor has done a great job finding creative solutions, even garnering praise from the public.

Despite issues with public impact and work schedule changes, Metro Water Services is on track to complete the project by the end of 2017.

"We're on schedule even though we've had to lax a little bit of the 24/7 — but the 24/7 was originally intended for us to get in there and get out as soon as we could ... and that's something the public probably appreciates as well."

Public buy-in

Before construction crews ever moved the first bucket of dirt, Metro Water Services staff spent six months setting the stage with a public outreach campaign.

"I think with the realization that we had to do this project, getting our stakeholder's buy-in was a big challenge," Toosi says.

The utility spent six months going door to door and holding community meetings to educate people on logistics of the project and why it was needed.

"We wanted to — well in advance of the project — let everyone in the community understand this is not just a quick, easy, we're going to dig a trench, put a little waterline in," says Sonia Allman, manager of strategic communications for Metro Water Services.

Difficulties of construction and extraordinary time constraints aside, Toosi and Allman say the public outreach was one of their biggest challenges.

"We worked very closely with the community," Allman says. "There have been a lot of hands on deck and a lot of communication. ... That all began in 2016, well in advance of the project beginning."

A never-ending story

The water main addition is just one piece of an eternal puzzle — there's always another project, another goal — but Metro Water Services officials believe they are where they need to be.

"We'd like to have at least two feeds coming out of (K.R. Harrington) for ultimate redundancy; we realize we can't bite the bullet and do everything at once," Toosi says. "But it's positioning us to do another project in the future, to continue getting redundancy and capacity in our system." ♦

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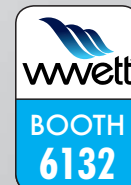
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SAFETY IS PARAMOUNT

Recent concern over health issues related to the steam-curing process deserve better research and data

By **Ted DeBoda**

Trenchless technologies continue to grow around the world because they have been a safe and cost-effective method of renewing our buried infrastructure for nearly half a century. These “no-dig” technologies minimize impact to businesses and traffic; use a smaller carbon footprint; and avoid tearing up and replacing roads, driveways, and landscapes.

Recently, there have been reports — including a Purdue University report titled “Worksite Chemical Air Emissions and Worker Exposure during Sanitary Sewer and Stormwater Pipe Rehabilitation Using Cured-in-Place-Pipe (CIPP)” — that these technologies, specifically steam-cured CIPP, may be the source of health issues. To our knowledge, while there have been complaints regarding the smell of resins, serious health issues associated with this technology have not been documented. Additionally, NASSCO members have reviewed these reports and found that the data used to support the conclusions are questionable.

NASSCO — together with other leading industry organizations such as NSF International, North American Society for Trenchless Technology, Water Research Center, Water Environment & Reuse Foundation, and American Composites Manufacturers Association — is currently working on a comprehensive study to provide the best data available to determine if there are health safety issues associated with steam-cured CIPP and, if so, what changes are needed to protect the health and safety of workers and the public.

Phase 1 involves an intensive review of several existing studies to determine the accuracy of the data and conclusions used, in addition to preparing a work plan to collect and analyze data that support or refute previous conclusions. Phase 2 will include the execution of that work plan using a professional environmental consultant and all available industry resources to collect the valid field data necessary to evaluate the risks and identify appropriate actions to ensure the safety and health of our communities.

NASSCO’s position is that the recently published articles related to the Purdue University report don’t include data or credible evidence that support the conclusions and that steam-cured CIPP continues to be a safe and reliable method of pipe rehabilitation when following recommended installation procedures, industry safety practices, and good housekeeping at job sites. Some articles supporting these reports show images of job sites where recommended procedures and safety practices are not followed, which is in direct opposition to the standards and training NASSCO provides and supports.

NASSCO holds paramount the safety of our industry’s employees and the public. Our comprehensive study, in partnership with other industry leaders, will work to achieve our mission to assure the continued acceptance and growth of trenchless technologies. ♦



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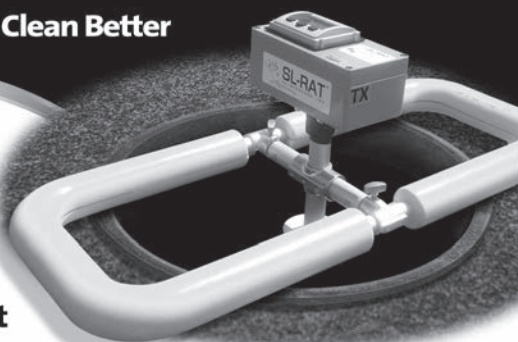
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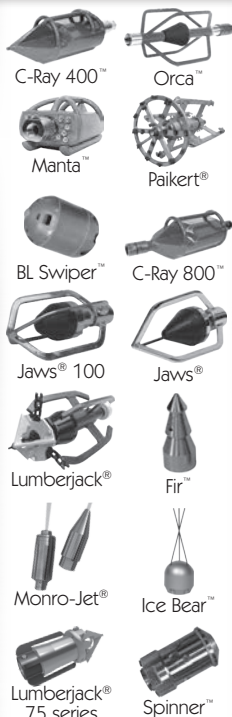
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CLEANING AND MAINTENANCE

By Craig Mandli

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Vac-Con industrial vacuum loader

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of onboard water. Its Hydro Drive powertrain system eliminates the need for a transfer case. Both single-piston and triplex pump options are available at 55 to 80 gpm at 2,000 to 3,000 psi with a 4,400 cfm blower and 18 inches Hg, built on an eco-friendly platform that provides greater fuel efficiency and offers noise reduction. **888/477-7611; www.sewerequipment.com.**

Supervac 2000 Triton

The **Triton** combination sewer cleaner from **Supervac 2000** has a water recycling system that uses a Juggler filter to allow continuous work without downtime for water filling. It filters water collected in the debris tank and transfers it to a water reservoir used by the Pratissoli water pump. It comes with a 2,500-gallon debris tank with stainless steel liner and vibrator, 1,500-gallon water tank, hydraulic boom and dump, and a full-opening rear door. Vacuum is provided by a 3,800 cfm at 27 inches Hg Robuschi USA blower, while jetting power is provided by an 80 gpm, 2,500 psi Pratissoli water pump. The rear door-mounted hydraulic hose reel holds 600 feet of 1-inch hose. **866/839-5702; www.supervac2000.com.**



Vac-Tron Equipment Mini-Combo Series

The **Vac-Tron Equipment Mini-Combo Series** combines high cfm vacuum with jetter capabilities. Its Cat jetter pump is rated at 2,000 psi at 15 gpm and can be used to clean

lateral lines up to 12 inches in diameter. It comes with 300 feet of 1/2-inch jetter hose with an electric hose reel. Options include a hydraulic boom or strong arm to maximize job performance by helping to reduce work fatigue that can sometimes occur from using a manually controlled vacuum hose. It is available mounted either on a trailer or truck. **888/822-8766; www.vactron.com.**

Vacall - Gradall Industries Recycler

The **Vacall - Gradall Industries Recycler** continuous water recycling system is available as an option for AllJetVac combination sewer cleaners, helping save time, increase working efficiency and conserve natural resources. The system vacuums water from sewer lines, puts it through a five-step filtering process, and then uses the same water to continue jetting. It includes a 240-gallon segregated clean-water tank section attached to a 10 gpm pump and 50-foot hose reel for washdown. One AllJetVac combination sewer cleaning truck can save an average of 5.7 million gallons of city water each year when equipped with a Recycler continuous water recycling system. **800/382-8302; www.vacall.com.**



Vactor Mfg. 2100 Plus

The **2100 Plus** sewer cleaner from **Vactor Mfg.** is available with a water recycling system that reuses water already in the sewer to clean sewer lines, potentially eliminating the need for clean water and saving thousands of



gallons of clean water every shift. The recycling system also helps improve productivity by eliminating time spent refilling the tank and driving to a tank-filling location. Initiated by a switch on the control panel, a five-stage filtration process combines settling and centrifugal separation and absolute 100-micron filtration, preventing solids from entering the jetting system. All components of the recycling system are located on the rear door of the 2100 Plus. **800/627-3171; www.vactor.com.**

JETTERS - TRUCK/TRAILER

Amazing Machinery BossJet Pro Box Jetter

The **BossJet Pro Box Jetter** from **Amazing Machinery** can be mounted in many configurations.

It comes with a Honda or Kohler engine, a triplex plunger pump and a Hannay Reels electric hose reel. All units are encased in a high-density aluminum box frame with an access panel on the side for exhaust release and ease of service. It comes with 200 feet of 1/4-inch I.D. jetter hose and laser and spin jet nozzles. It is designed to clean and clear 2- to 6-inch pipes. Options include a foot pedal, trap kit, remote reel and portapotty head attachment for the smaller lines. All units include a washdown gun and wand, four pressure washer tips, and a chemical injector for easy cleanup. **800/504-7435; www.amazingmachinery.com.**



American Jetter 51T Series Hot Jetter

The **51T Series Hot Jetter** from **American Jetter** offers up to 74 hp of hot-water cleaning power and flows from 8 to 24 gpm up to 4,000 psi. Dual or triple diesel burners offer maximum

water heating capability. Consistent power is provided by a 37 hp Kohler gas engine. A dual-engine option provides 74 hp. Low-water shut-off prevents pump damage if the 330-gallon tank runs low. Standard hose reel-speed control allows for precise cleaning in both directions. The wireless remote option allows for water on/off, engine shutdown and hose reel control. The heavy-duty square tubing trailer offers standard electric brakes on both axles. **866/944-3569; www.americanjetter.com.**

Cam Spray TT4025HZ-350

The model **TT4025HZ-350** trailer jetter from **Cam Spray** produces 25 gpm at 4,000 psi using a U.S. EPA Tier 4 Final Hatz Diesel

74 hp turbo intercooled, liquid-cooled engine. It comes with an over-center clutch, control panel with hour meter, low-fuel gauge, low-fuel shut-down, over-pressure shutdown and digital pressure readout. The reel is hydraulic powered with variable speed and comes mounted on a slide-out with angle adjustment fitted with 500 feet of 5/8-inch hose, manual shut-off valve and analog pressure gauge. RCM wireless remote control modes include valve open, valve close, engine idle down with a 15-second time delay shutdown, emergency shut-off, two-speed engine revolutions per minute control and auxiliary 10-amp circuit with on/off control. **800/648-5011; www.camspray.com.**



(continued)



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.**

NLB Corp. 335 DHW

The **335 DHW** hot-water jetting unit from **NLB Corp.** has a dependable triplex pump capable of 15 gpm at 3,500 psi; a Kubota v3600 66 hp engine provides the power in a direct-drive configuration that eliminates the PTO and PTO maintenance.

Its 700,000 Btu burner unit addresses the demands of the many cycles, long hours, and transportation requirements in the life of a typical hot-water unit. An overhead-mounted water tank is easy to winterize and has integrated water lubrication lines and a 75-micron inlet strainer that can be rinsed or cleaned, eliminating the traditional filter. A rupture disk has also been eliminated from the unit's design and replaced with a self-resetting pop-off valve, saving time and money for the operator. **800/227-7652; www.nlbcorp.com.**



Super Products SuperJet

The **SuperJet** truck-mounted jetter from **Super Products** has a double-acting, single-piston hydraulically powered water pump that offers a 1-1 oil-to-water ratio and rated design capacity of 100 gpm and 3,000 psi continuous duty. Its modular water tank

setup easily accommodates capacities from 1,000 to 3,200 gallons. It has a single-engine design that emits lower sound levels, reducing fuel use by 40 percent compared to dual-engine units. Its rear compartment is heated with an 80,000 Btu/h heater that enables year-round operation in freezing environments. An easy-to-use control panel performs a number of functions including adjustable engine throttle with water pressure speed dial, on/off water pump PTO, water pressure and gallons per minute, and hose reel joystick as well as pay-in/pay-out with speed control. **262/796-5939; www.superproductsllc.com.**

Water Cannon Inc. - MWBE 16T55

The **16T55** trailer jetter from **Water Cannon Inc. - MWBE** comes with an onboard 200-gallon water tank capacity and customizable jetter hose up to 500 feet. It is mounted on a two-wheel commercial jetter trailer. It comes with a poly toolbox, lights, a front jack with wheel, safety chains and aluminum fenders. The commercial high-pressure jetter is powered by a Honda GX690 twin-cylinder, electric-start engine with V-belt drive, trailer-mounted skid, and 15-gallon EPA- and CARB-approved poly fuel tank. Its TS-Series General triplex plunger pump offers 8 gpm at 3,500 psi, with a pump-mounted jetter pulse valve and foot valve with 8-foot jumper hose. Three jetter nozzles — the Penetrator, Flusher and De-Greaser/De-Icer — are included. **800/333-9274; www.watercannon.com.**



JETTING ACCESSORY

Chempace Corp. Sewer Foam

Sewer Foam high-foaming sewer and drainline cleaner and degreaser from **Chempace Corp.** — when combined with the high-pressure water of a jet truck — is designed to clean all types of grease and organics from sewer lines and drainlines. The foam incorporates a long-lasting bacterial treatment to assist in solids and odor reduction. It is noncaustic, concentrated at 2 ounces per gallon, and safe for all pipes and jet trucks. **800/423-5350; www.chempace.com.**



NOZZLES



EnviroSight Jetscan HD

Deployed on any 3/4- or 1 1/2-inch jetter hose, the **Jetscan HD** video nozzle from **EnviroSight** is a quick, easy way for cleaning crews to determine what tools and setup to use, identify blockages during emergency callouts, and document the outcome of cleaning operations. It captures HD video footage from underground that can be viewed immediately afterward on a tablet. As it advances down pipe 8 to 24 inches in diameter, it records 720p HD video in MPEG format to an onboard SD memory card. Immediately afterward, the card can be removed and video viewed on an iPad or other SD-compatible device. Twin high-output LED lamps ensure bright, vivid footage. It lasts four hours on rechargeable lithium-ion batteries and stores up to eight hours of video. **866/936-8476; www.envirosight.com.**

Enz USA Rotodrill

The **Rotodrill** nozzle from **Enz USA** has a rotating front jet for improved cutting performance. It's effective at clearing blocked or frozen pipes and moving heavy debris. It has ideal propulsion but can also be used in hydroexcavation by plugging off the thrust jets. This versatile nozzle is available in 1/2-, 3/4- and 1-inch systems. **877/369-8721; www.enzusainc.com.**



Hammelmann Corp. RD MASTERJET

The **RD MASTERJET** nozzle from **Hammelmann Corp.** has HPS sealing technology and adjustable speed rotation. It is designed for use with shotguns, robotic lance systems, or replacement of any rotating tool. It is lightweight at 2.2 pounds and has a compact ergonomic design that's 2.2 inches in diameter and 6.5 inches in length. It can be used at operating pressures up to 46,500 psi with its optimum internal flow allowing the pump's total performance to be used. It has a versatile universal nozzle hub for working with nozzles with two or four inserts. Nozzle inserts are countersunk in the nozzle carrier with blast-back shields. Speed is controlled by an infinitely variable magnetic brake. It can be used for cleaning and washing, expansion joint removal, coating and paint removal from surfaces, blasting pipe externals, paint booth grid and skid cleanup, superstructure surface preparation, heavy machinery cleanup, and surface preparation. **800/783-4935; www.hammelmann.com.**



Hydra-Flex Aqua-Rocket

The **Aqua-Rocket** industrial turbo nozzle from **Hydra-Flex** is constructed with a stainless steel housing and a tungsten carbide tip and seat to withstand harsh environments and provide long life. Equipped with a high-temperature, drop-resistant rubber cover and available repair kits, all components are designed for longer life and lower overall

operating costs. It blasts a zero-degree water jet at 1,500 to 4,000 psi while rotating at an optimal speed to form a 22-degree, cone-shaped spray pattern. Its optimized stream quality results in greater impingement, allowing the user to attack the toughest dirt and grime. 952/808-3640; www.hydrflexinc.com.

NozzTeq MANTA Bottom Cleaner

The **MANTA Bottom Cleaner** from **NozzTeq** is recycled-water-friendly with interior surfaces and interchangeable rear jetting plates made of stainless steel and ceramic parts to stand up to hard water and grit. It is very heavy at more than 50 pounds, and it slides on wide runners that are replaceable, keeping it on the bottom of large-diameter pipes where it will do the most good. The nozzle's bottom surface will never wear out. Its jetting plate is interchangeable and replaceable, and the plates come in 8-, 10- and 12-jet configurations. 866/620-5915; www.nozzteq.com.



Sewer Pro Shop BLUESTAR



BLUESTAR sewer cleaning nozzles from **Sewer Pro Shop** are manufactured with optimized 3-D hydro-mechanics by Intersewer. Pressurized water is first divided by a conically-shaped piece and smoothly turned around in the nozzle chamber before being guided directly into the stainless steel nozzle inserts by means of five-axial CNC precision manufacturing. Ceramic nozzle inserts are available for use in conjunction with recycled water. The nozzles are neither bonded nor screwed together. They use case-hardened steel and stainless steel components. 470/592-1717; www.sewerproshop.com.

StoneAge WHR Switcher

The **WHR Switcher** for smaller pipes from **StoneAge** is engineered to allow the operator to remotely switch between pulling and cleaning jets while the tool is in the pipe. When the pump is idled down and brought back to pressure, the tool will switch the water flow back and forth between two different jet patterns: a rear jet pattern for maximum pulling or flushing, and a side jet pattern for effective cleaning and cutting. This allows the same tool to switch between pulling and cleaning, reducing the time and water usage required to make multiple runs with different nozzles. It has a 3/4-inch hose inlet connection, navigates pipes 6 to 18 inches in diameter, and handles pressures up to 8,000 psi and flow rates up to 50 gpm. 970/259-2869; www.stoneagetools.com.



Suttner America Co. jetting nozzles

Suttner America Co. offers jetting nozzles from 1/8 up to 1 inch for cleaning drainpipes up to 28 inches in diameter. Non-rotating, rotating, milling or bullet styles are available. Sewer jetting hose from 1/8 to 1 1/4 inches and foot-actuated valves up to 7,300 psi are also available. 800/831-0660; www.suttner.com.

The Plug Hug Fire Hydrant Cleaning System

The **Plug Hug Fire Hydrant Cleaning System** can be used to prepare fire hydrants for paint and for clearing snow in locations impacted by winter weather. It attaches to the hydraulic auger drive motor connected to a skid-steer, backhoe or mini-excavator, safely eliminating the hands-on process associated with current methods of abrasive/water blasting and angle/needle grinders. This eliminates hand, eye, and back injuries and risk of serious injury or death from the proximity to traffic. It also reduces time allocation up to 60 percent, returning those hours to the operational pool. It's a simple mechanized descaling process that exceeds industry preparation requirements and best practices. 719/313-2791; www.theplughug.com.



PORTABLE JETTER



Bullfrog Industries Crap Shooter 2

The **Crap Shooter 2** from **Bullfrog Industries** weighs less than 25 pounds. It offers a full 2,000 psi running off a 15-amp circuit without losing any water pressure or any lost time searching for an adequate power outlet. It comes with a 75-foot, high-pressure hose with a quick connect that attaches to the unit and two heavy-duty nozzles — the Flusher and Thruster. It is designed to handle up to 3-inch pipes. Two different faucet adapters allow the unit to be hooked up just about anywhere. All fixtures and hoses can handle up to 120-degree water temperatures. A heavy-duty case with a carry handle encases the entire unit. 303/338-0805; www.bullfrogind.com.

TV INSPECTION CAMERAS

CUES MPlus+ XL

The **CUES MPlus+ XL** push system enables easy operation with its all-in-one setup and flexibility by quick removal of the control unit to be used separately. It includes a coiler configuration and pan-and-tilt camera designed for mainline and larger pipeline applications up to 500 feet. It integrates video observation coding, observation coding interface and digital recording into an easy-to-use package. This lightweight system includes large and durable wheels for portability and a balanced footprint for stability. It is manufactured to handle rigorous field use. 800/327-7791; www.cuesinc.com.



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MyTana Mfg. MS11-NG2

The **MS11-NG2** midsize inspection system from **MyTana Mfg.** has USB for recording and storage. The system is suitable for inspecting 3- to 6-inch lines with the choice of 150 or 200 feet of push-rod. The unit has a 64 GB internal drive as well as two onboard USB ports, and a 32 GB removable USB drive. The one-piece design is lightweight with a carrying handle. The color camera head is self-leveling with a built-in 512 Hz transmitter for locating trouble spots, even in cast iron pipes. **800/328-8170; www.mytana.com.**



Pipeline Renewal Technologies CleanSteer 40

The **CleanSteer 40** from **Pipeline Renewal Technologies** uses high-pressure water for propulsion, steering and cleaning as it captures live inspection video from inside lateral lines. Its design means it can traverse multiple bends in pipes, steer through branches, and levitate above debris, allowing municipal contractors and commercial plumbers to locate failed pipes, cross bores and blockages, and clean pipes. It is fully water-driven, with six propulsion nozzles generating the power needed to pull its own flexible hose through multiple bends, and a side nozzle on the camera can be aimed to steer through diverging pipes and hover past obstacles. An optional forward-facing nozzle can be pulsed to clear debris and other obstructions. The system works with any high-pressure water source, including pressure washers and combination trucks. Its 1/2-inch hose comes in lengths from 115 to 190 feet. **866/936-8476; www.pipelinert.com.**



Spartan Tool Explorer

The **Explorer** modular camera system from **Spartan Tool** has a control box that is compatible with five different pushrods 5 to 14 mm in diameter and 130 to 400 feet in length. Up to nine hours of battery life lets the user complete multiple jobs without recharging. The open-reel design allows for easy cleaning, and the stainless steel camera heads provide for extra durability. USB, SD and cloud storage is available. It comes with WinCan software pre-installed, allowing the user to map entire plumbing systems. The screen allows clear viewing, even in direct sunlight. **800/435-3866; www.spartantool.com.**



WATERBLASTING

Jetstream of Houston X-Series

The **X-Series** mobile waterblast unit from **Jetstream of Houston** provides the flexibility to tackle tough cleaning jobs and the efficiency to keep operating costs low. It has a greaseless spread-bearing PTO that provides reliable power transmission and reduced maintenance time. It also has an integrated filter and water tank system that extends component life and increases operating time. Its strong, light frame allows for better towing performance. It is built around the UNx fluid end system designed for fast conversion between 5,000 and 40,000 psi operating pressures. **800/231-8192; www.waterblast.com.** ♦




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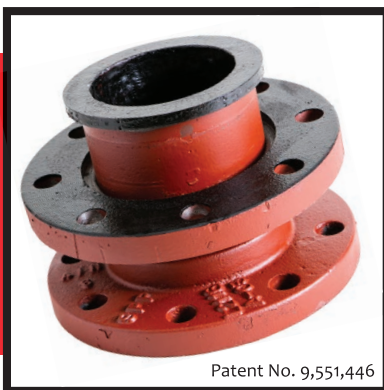
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Compact jetter saves time, trouble and money

Problem:

Craig Casteen of Casteen Plumbing & Repair in North Carolina faced working in a residential crawl space that didn't allow much room to maneuver. He needed a jetting unit compact enough to get into tight areas and powerful enough to dislodge blockages from small lines.

Solution:

Casteen chose the **JM-1000 Mini-Jet** from **General Pipe Cleaners**. The compact, lightweight, electric-powered unit lets him clear grease, sand, and ice from small, 1 1/2- to 3-inch lines up to 50 feet long. It provides 1,500 psi of cleaning power. Pulse technology helps slide the hose around tight bends and down lines. It breaks the initial tension between the hose surface and pipe walls, increasing cleaning power. The JM-1000 weighs 23 pounds for easy carrying and is convenient for jobs completed by one person.



RESULT:

Casteen used the unit in the crawl space to quickly clear the blockage. **800/245-6200; www.drainbrain.com.**

Acoustic inspection incorporated as part of a capacity, management, operation and maintenance program

Problem:

The town of Uxbridge Department of Public Works Wastewater Division serves a population of 12,000 people in Massachusetts, about an hour south-west of Boston. The town's 40-mile wastewater collections system and accompanying treatment plant are managed by a staff of only six employees. So, when their permit requirements led to the need for a CMOM collections O&M plan, Jim Legg, the operations supervisor, looked to incorporate new technologies that could maximize the efficiency of the limited field staff.

Solution:

In the summer of 2015, Uxbridge implemented an **SL-RAT** acoustic inspection program from **InfoSense** as the first step in their collections



system maintenance program. The device is used as a first-line blockage screening tool to help the town avoid wasting effort cleaning clean pipe. "It is amazing how quickly it gives you good information at very low cost," Legg says. Uxbridge crews the equipment with two people who frequently inspect 10,000 or more feet per day.

RESULT:

Uxbridge has screened more than 25 percent of its collections system in two years while using it only one to three days per month. Additionally, the SL-RAT helps the utility comply with its Massachusetts Department of Environmental Protection and U.S. EPA Region 1 permit requirements. It has allowed the field crews to focus their cleaning and CCTV activity on the 5 to 10 percent of pipes that have significant problems. No sanitary sewer overflows have occurred since the acoustic inspection program was implemented. **877/747-3245; www.infosense.com.**

Transportable pipe beveller speeds up production

Problem:

Jeff Young, owner of the central Pennsylvania welding and fabrication company J.R. Young Inc., was looking for a way to speed up production in his 10-man shop. The company is a subcontractor to HVAC contractors; they fabricate and install carbon steel pipe from 2 to 24 inches in diameter. For Young and his team, pipe preparation was a stumbling block, slowing the company down and taking too many man-hours.

Solution:

Young read about and watched videos on the **RIDGID B-500 Transportable Pipe Beveller**, which convinced him to buy the tool in June 2015. It quickly sets up and bevels 10-inch-diameter Schedule 40 pipes in 45 seconds without flames, replacing traditional beveling methods such as grinding. It mounts to the end of pipes 4 inches or greater in diameter, with a maximum wall thickness of a 1/2 inch, as well as on flat plates up to a 1/2 inch thick.



RESULT:

Since purchasing the unit, Young has found it to be faster than the more expensive bevellers the company had been using. They have six men doing the same amount of work it took eight men to do before because they can work faster. He has also been impressed with the precision and durability of the cutter inserts. Hundreds of cuts have been made without requiring a rotation of the inserts, and quality has been outstanding. **800/769-7743; www.ridgid.com.** ♦

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Product Spotlight

Lightweight system automates heat exchanger cleaning

By Craig Mandli

Without efficient heat exchanger performance, output suffers while costs increase and bottom-line results suffer.

The prime culprit in these situations is often grime and sediment buildup, which causes fouling of the exchangers and the reduction of efficient heat transference. The clear solution to this recurring problem is cleaning the heat exchangers at regular intervals. StoneAge offers the ABX-3L for just such situations.

The ABX-3L is an automated system for hands-free tube bundle and Fin Fan heat exchanger cleaning applications. It is designed to run triple-, dual-, or single-flex lance setups with an emphasis on portability, ease of setup and safety.

"This unit is going to be a fit for cleaning heat exchangers in an industrial setting, such as a municipal water or wastewater treatment plant," says Frank Romito Jr., an automation technician with StoneAge. "It is very convenient to use, and compatible with a lot of waterblasting systems."

The ABX-3L can be used with any pressure rated hose ranging in size from 3/2 to 8/4. Paired with StoneAge Banshee rotary tube cleaning nozzles and the company's Lightweight Positioner, it offers safe and efficient tube cleaning in harsh exchanger environments. Hose clamp pressure and feed rates can be quickly adjusted for repeatable, consistent cleaning, while its modular compact design makes it easy to transport and quick to set up, with all components

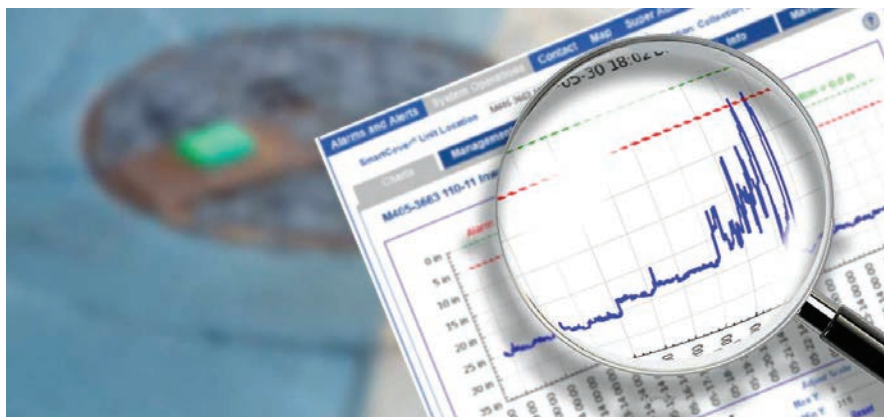


coming in under 50 pounds. According to Romito, the ABX-3L improves several aspects of the company's previous version, the ABX-2L.

"It increases the amount of torque you can use, and has an updated guide assembly that can be oriented to fit different pit patterns," he says. "It really is a 'one size fits all' deal."

The unit includes a high-visibility guide tube assembly for easy indexing, with no tools or adapters required for guide tube adjustment, minimizing downtime when switching between hose sizes. It comes with a steel-reinforced drive belt with durable polyurethane cover, making it reliable for hundreds of hours of operation. It offers independent forward/reverse speed control from 0.3 to 3 feet per second. Its consistent cleaning in both directions also produces results in less time.

"It was designed as a modular unit with parts that are easy to replace in the field," Romito says. "The nice thing about this product line is that everything is designed to hook to everything else. That makes it easier on the user." 866/795-1586; www.stoneagetools.com.



SmartTrend from SmartCover

SmartTrend is a comprehensive software tool enabling users to anticipate overflow events at remote monitoring sites. The software automatically scans each site to analyze trends in the collections system. It determines conditions using advanced signal processing and pattern recognition, sending advisories to users when a trend is discovered, including early warning for SSOs and CSOs before they occur. SmartTrend promotes advanced planning for maintenance and capital repairs. Since each monitored site can have its own personality, the sensitivity of the SmartTrend signal processing is adjusted on a site-by-site basis. 760/291-1980; www.smartcoversystems.com.

Endress+Hauser CA80TP phosphorus analyzer

The Liquiline CA80TP phosphorus analyzer from Endress+Hauser monitors industrial wastewater as well as inlet and outlet streams of municipal wastewater treatment plants. It uses a thermal digestion technique along with colorimetric analysis, requiring only a small quantity of reagents. The phosphorus measurement is performed online and is less time-consuming than sending to a lab for analysis. It measures phosphorus in ranges of .05 to 10 mg/L or .5 to 50 mg/L. It has two 4-20mA outputs with the option for additional outputs including the Modbus RS485, Modbus TCP and EtherNet/IP. 888/363-7377; www.us.endress.com/ca80tp.



Fluid Conservation Systems MultiLog LX-2

The MultiLog LX-2 from Fluid Conservation Systems is a battery-powered, multiple-channel data logger for flow and pressure monitoring in water distribution networks. The device builds upon its predecessor with the addition of remote data transfer and upgraded processing abilities. The LX-2 also has a serial input that enables it to connect to a wide range of leak noise and ultrasonic level sensors and water meters. It is designed to fit inside very shallow valve box installations and is IP68-rated fully waterproof. 800/531-5465; www.fluidconservation.com.



Felling Trailers Turret Reel Trailer

The FT-10 R Turret Reel Trailer from Felling Trailers has a 360-degree rotating turret assembly so virtually no right-of-way or easement will prohibit the operation. To activate, pull to the side of the road, disengage the level-actuated locking pin, and rotate the reel to the direction needed. The turret can lock into any position in 15-degree increments. The optional 16-inch bronze tensioning brake controls the overspin of the reel and provides tension as the material is being pulled off the trailer. The brake assembly has an infinitely adjustable manual brake caliper and up to 50,000 pounds of torque. 888/335-5464; www.felling.com.



Cat Pumps plunger pump Model 67070

The Model 67070 high-pressure plunger pump from Cat Pumps is ideal for sewer jetting and hydroexcavating applications that require high-flow performance at higher pressures and intermittent duty operation. It is rated at 50 gpm at 2,000 psi. The drive-end of the pump is built from the 60-frame mechanical drive, and oversized, premium crankshaft bearings offer high loading capacity and prolonged bearing life. The crankcase crosshead area is concentric with a 360-degree plunger rod support that features a drilled-through oil port to lubricate the front side of the crosshead area. 763/780-5440; www.catpumps.com. ♦



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INDUSTRY NEWS

DECEMBER 2017

JWC Environmental receives Water Environment Federation Innovative Technology Award

JWC Environmental was awarded the Innovative Technology Award by WEF for its Wipes Ready technologies. The grinder technology, available exclusively on the company's Muffin Monster and Channel Monster products, helps combat the problems caused by disposable wipes.

Envirosight releases new poster for sewer workers

A new, free poster from Envirosight illustrates how sewer workers can protect themselves from workplace biohazards using personal protective equipment, developing proper hygiene habits and cleanup practices, and obtaining recommended vaccinations. Working in and around sewage increases the risk of disease and infection, so workers must take extra precautions to protect themselves and their families.

Bockhorst appointed chief operating officer of Badger Meter

Badger Meter announced it has appointed Kenneth C. Bockhorst to the newly created position of senior vice president and chief operating officer. He brings more than 20 years' experience to global operations management, most recently serving as executive vice president of the energy segment of Actuant Corp.



Kenneth C. Bockhorst

Singer added to sales team with two new hires

Singer has added Roger Hahn to the position of western USA sales manager and Bryan Cole as the central USA sales manager. Hahn brings more than 30 years' water industry sales experience, and Cole brings 12 years' technical sales experience in the valve and manufacturing industry.



Roger Hahn



Bryan Cole

Kyle Warren joins Sprayroq

Sprayroq announced the addition of Kyle Warren to its corporate team as operations assistant. He will be responsible for the technical and customer service side of the operations team. Warren has his master's and bachelor's degrees from the University of Alabama, and he is in the process of completing his welding certification.



Kyle Warren



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WORTH NOTING

PEOPLE/AWARDS

Brian Bracey was named executive director of the Huntington (West Virginia) Water Quality Board, which is the umbrella agency for the Huntington Sanitary Board, Huntington Stormwater Utility and Huntington Floodwall Division.

LEARNING OPPORTUNITIES

Wisconsin

The University of Wisconsin-Madison is offering a Using WinSLAMM: Meeting Urban Stormwater Management Goals seminar Feb. 27-28 in Madison, Wisconsin. Visit www.epd.wisc.edu. ♦

CALENDAR

Dec. 6-8

Florida Stormwater Association Winter Conference, Hilton Orlando, Orlando, Florida. Visit www.florida-stormwater.org.

Feb. 20-23

Water Environment Federation's Utility Management Conference, Hyatt Regency Riverwalk, San Antonio. Visit www.wef.org.

March 1-3

American Society of Civil Engineers CI (Construction Innovation) Summit, Hilton Fort Worth, Fort Worth, Texas. Visit www.cisummit.org.

March 6-9

National Utility Contractors Association's Annual Convention, Wyndham San Antonio Riverwalk, San Antonio. Visit www.nuca.com.

April 19-21

American Society of Civil Engineers Structures Congress, Fort Worth Convention Center, Fort Worth, Texas. Visit www.structurescongress.org.

April 22-24

American Society of Civil Engineers Surveying and Geomatics Conference, Cal Poly Pomona university, Pomona, California. Visit www.surveyingconference.org.

April 22-25

American Water Resources Association Spring Specialty Conference: GIS and Water Resources, Rosen Centre Hotel, Orlando, Florida. Visit www.awra.org.

June 11-14

American Water Works Association Annual Conference & Exposition, Mandalay Bay Convention Center, Las Vegas. Visit www.awwa.org.

July 29-Aug. 1

American Society of Agricultural and Biological Engineers Annual International Meeting, Cobo Center, Detroit. Visit www.asabe.org.

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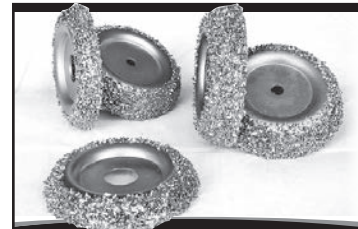
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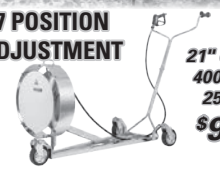
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